

Memorandum

Date: June 14, 1999
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To: Commissioner Robert A. Laurie
Commissioner David A. Rohy, Ph.D.

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From: **California Energy Commission** - Marc Pryor
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Subject: REVISED AND SUPPLEMENTAL TESTIMONY TO THE LA PALOMA GENERATING PROJECT (98-AFC-2) FINAL STAFF ASSESSMENT

On April 7, 1999, the California Energy Commission (Energy Commission) staff filed its Final Staff Assessment (FSA) for the La Paloma Generating Project, a 1,048 megawatt natural gas-fired power plant to be located in western Kern County, California. On April 28, 1999 the committee ordered staff to submit revised testimonies for air quality, biological resources and socioeconomics, and a supplemental testimony for water resources. These testimonies are attached.

SUMMARY OF THE REVISED DOCUMENTS

AIR QUALITY

Analysis and conditions have been modified to reflect the information contained in the San Joaquin Valley Unified Air Pollution Control District's final Determination of Compliance that was issued on May 28, 1999.

BIOLOGY

Minor revisions to the Biological Resources testimony were made as a result of comments staff received in an April 14, 1999 submittal from Allan J. Thompson. Revisions reflect a need to properly identify that the California Department of Fish and Game (CDFG) will provide an Incidental Take Permit to the applicant for the project. Additional revisions were made as a result of recent conversations staff has had with CDFG and U. S. Fish and Wildlife Service staff regarding what would be contained in the CDFG Incidental Take Permit and the federal Biological Opinion for the La Paloma project.

SOCIOECONOMICS

The revisions primarily involve corrections to the identified State laws, ordinances, regulations and standards; and under Cumulative Impacts, changes to the number of workers estimated to result from the project and from other power plant development; changes to the number of school children estimated to be added to Kern County schools; changes to the description of the impact on the Kern County Fire Department; and an update to the discussion of the State Board of Equalization's unitary tax

proposal. Proposed condition of certification SOCIO-2 was also revised consistent with new information regarding work toward and agreement between La Paloma Generating Company, LLC and the Kern County Fire Department.

SOIL AND WATER RESOURCES

Staff's Supplemental Testimony for Soil & Water resources provides an update on U.S. Environmental Protection Agency (EPA) permitting of the injection wells for the proposed project. On June 7, 1999 the EPA issued a draft Underground Injection Control Permit for public review. After a 30 day review period the EPA should adopt the final permit.

In addition, the applicant is requesting the ability to determine whether to use either injection wells or a zero discharge system for wastewater disposal following certification. On May 10, 1999, the applicant submitted additional information on the zero discharge system. A concern with such systems is to ensure that the cake solid waste generated by such systems are not hazardous. Information submitted by LPGP indicates that this material would not be hazardous and could be disposed of in landfills which can accept non-hazardous materials. Staff also recommends conditions of certification to reflect the use of either wastewater disposal system.

Attachment

cc: Proof of Service

AIR QUALITY

Revised Testimony of Keith Golden

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the construction and operation of the proposed La Paloma Generating Project (LPGP). Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), ozone (O₃), volatile organic compounds (VOC) and particulate matter less than 10 microns in diameter (PM₁₀).

In carrying out this analysis, the California Energy Commission staff evaluated the following major points:

- whether the La Paloma Generating Project is likely to conform with applicable Federal, State and San Joaquin Valley Unified Air Pollution Control District air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations, section 1742.5 (b);
- whether the LPGP is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b); and
- whether the mitigation proposed for the LPGP is adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1744 (b).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Federal Clean Air Act (40 CFR 52.21), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR analysis has been delegated by the Environmental Protection Agency (EPA) to the San Joaquin Valley Unified Air Pollution Control District (District). The EPA determines the conformance with the PSD regulations. The PSD requirements apply only to those projects (known as major sources) that exceed 100 tons per year for any pollutant.

STATE

The California State Health and Safety Code, section 41700, requires that “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.”

LOCAL

The proposed project is subject to the following San Joaquin Valley Unified Air Pollution Control District rules and regulations:

RULE 2201 - NEW AND MODIFIED STATIONARY SOURCE REVIEW RULE

The main functions of the District's New Source Review Rule are to allow for the issuance of Authorities to Construct, Permits to Operate, the application of Best Available Control Technology (BACT) to new permit sources and to require the new permit source to secure emission offsets.

SECTION 4.1 - BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology is defined as: a) has been contained in any State Implementation Plan and approved by EPA; b) the most stringent emission limitation or control technique that has been achieved in practice for a class of source, or c) any other emission limitation or control technique which the District's Air Pollution Control Officer (APCO) finds is technologically feasible and is cost effective. BACT will apply to any air pollutant that results in an emissions increase of 2 pounds per day. In the case of the LPGP, BACT will apply for NO_x, SO₂, PM₁₀, VOC and CO emissions from all point sources of the project.

SECTION 4.2 - OFFSETS

Emissions offsets for new sources are required when those sources exceed the following emissions levels:

- Sulfur oxides - 150 lbs/day
- PM₁₀ - 80 lb./day
- Oxides of nitrogen - 10 tons/year
- Volatile organic compounds - 10 tons/year

The LPGP exceeds all of the above emission levels; therefore offsets are required for all four of these pollutants. The emission offsets provided shall be adjusted according to the distance of the offsets from the LPGP. The ratios are:

- Within 15 miles of the same source - 1.2 to 1
- 15 miles or more from the source - 1.5 to 1

Section 4.2.5.3 allows for the use of interpollutant offsets (including PM10 precursors for PM10) on a case-by-case basis, provided that the applicant demonstrates that the emissions increase will not cause a violation of any ambient air quality standard. The ratio for interpollutant trading shall be based on an air quality analysis and shall be equal to or greater than the minimum offsetting requirements (the distance ratios) of this rule.

SECTION 4.3 - ADDITIONAL SOURCE REQUIREMENTS

Rule 4.3.2.1 requires that a new source not cause, or make worse, the violation of an ambient air quality standard as demonstrated through analysis with air dispersion models.

RULE 2520 – FEDERALLY MANDATED OPERATING PERMITS

Requires that a project owner file a Title V Operating Permit with the District within 12 months of commencing operation. A project is subject to this requirement if any of the following apply: the project is a major stationary source (under PSD definitions), it has the potential to emit greater than 100 tons per year of a criteria pollutant, that any equipment is subject to New Source Performance Standards, the project is subject to Title IV Acid Rain program, or the applicant is required to obtain a PSD permit from EPA. The Title V permit application requires that the owner submit information on the operation of the air polluting equipment, the emission controls, the quantities of emissions, the monitoring of the equipment as well as other information requirements.

RULE 2540 – ACID RAIN PROGRAM

A project greater than 25 MW and installed after November 15, 1990, must submit an acid rain program permit application to the District. The acid rain requirements will become part of the Title V Operating Program (Rule 2520). The specific requirements for the LPGA will be discussed in the "Compliance with LORS – Local" later in this analysis.

RULE 4001 - NEW SOURCE PERFORMANCE STANDARDS

Specifies that a project must meet the requirements of the Federal New Source Performance Standards (NSPS) specified in Title 40, Code of Federal Regulations, Part 60, Chapter 1. Subpart GG, which pertains to Stationary Gas Turbines, requires that NOx concentrations are a function of the heat rate of the combustion, which in this case would be approximately 116 ppmv at 15% O2. In addition, the SO2 concentration shall be less than 150 ppmv and the sulfur content of the fuel shall no greater than 0.8 percent by weight.

RULE 4101 - VISIBLE EMISSIONS

Prohibits air emissions, other than water vapor, of more than Ringelmann No. 1 (20 percent opacity) for more than 3 minutes in any one hour.

RULE 4201 - PARTICULATE MATTER CONCENTRATION

Limits particulate emissions from sources such as the gas turbines, cooling towers and emergency fire water pumps to less than 0.1 grain per cubic foot of exhaust gas at dry conditions.

RULE 4202 – PARTICULATE MATTER EMISSION RATE

Limits hourly particulate emissions based on the process rate of the process. Combustion of gaseous and liquid fuels are excluded from this rule, however the particulate emissions associated with the cooling tower are subject to the emission limits of this rule.

RULE 4703 - STATIONARY GAS TURBINES

Limits NO_x concentrations to 12.2 ppm for the SCR controlled turbines and 21 ppm for the SCONO_x controlled turbine. In addition there is a limit in CO concentrations of less than 200 ppm.

RULE 4801 - SO₂ CONCENTRATION

Limits the SO₂ concentration emitted into the atmosphere to no greater than 0.2 percent by volume.

RULE 8010 - FUGITIVE DUST ADMINISTRATIVE REQUIREMENTS FOR CONTROL OF FINE PARTICULATE MATTER (PM-10)

Specifies the types of chemical stabilizing agents and dust suppressant materials that can (and cannot) be used to minimize fugitive dust.

RULE 8020 - FUGITIVE DUST REQUIREMENTS FOR CONTROL OF FINE PARTICULATE MATTER (PM-10) FROM CONSTRUCTION, DEMOLITION, EXCAVATION, AND EXTRACTION ACTIVITIES

Requires that fugitive dust emissions during construction activities be limited to no greater than 40 percent opacity by means of water application or chemical dust suppressants. The rule also encourages the use of paved access aprons, gravel strips, wheel washers or other measures to limit mud or dirt carry-out onto paved public roads.

RULE 8030 - CONTROL OF PM₁₀ FROM HANDLING AND STORAGE OF BULK MATERIALS

Limits the fugitive dust emissions from the handling and storage of materials, such as the borrow fill dirt material to be used for the LPGP. It specifies that bulk

materials be transported using wetting agents, allow appropriate freeboard space in the vehicles, or be covered. It also requires that stored materials be covered or stabilized.

RULE 8060 - CONTROL OF PM10 FROM PAVED AND UNPAVED ROADS

Specifies the width of paved shoulders on paved roads or the use of chemical dust suppressants on unpaved roadways, shoulders and medians.

RULE 8070 - CONTROL OF PM10 FROM VEHICLE/EQUIPMENT PARKING, SHIPPING, RECEIVING, TRANSFER, FUELING AND SERVICE AREAS

This rule is intended to limit fugitive dust from unpaved parking areas by means of using water or chemical dust suppressants or the use of gravel. It also requires that the affected owners/operators shall remove tracked out mud and dirt onto public roadways once a day.

ENVIRONMENTAL SETTING

METEOROLOGICAL CONDITIONS

The climate of the southern San Joaquin Valley is typically dominated by hot dry summers and mild winters with relatively small amounts of precipitation. The semi-permanent Pacific High over the eastern Pacific Ocean dominates the weather during the summer months, blocking low pressure systems from passing through the area. The Pacific High, along with the Temblor Range to the west that blocks the marine air influence from the Pacific Ocean, results in summers that are usually quite warm, with average daily maximum temperatures during July of over 98°F.

During the winter months, the Pacific High weakens and migrates to the south allowing Pacific storms into California. The annual rainfall in the Bakersfield area is only 5.7 inches. In between storms, high pressure from the Great Basin High can block storms and result in persistent tule fog caused by temperature inversions. Daily maximums during the December-January months are a relatively mild 57°F, with lows averaging 38°F. At the Maricopa weather station, a record high of 115°F and record low of 15°F was measured. These temperatures are used in determining the maximum possible emissions from the LPGP and the maximum emission impacts in the air dispersion modeling analysis.

Winds in the area are strongly influenced by the Temblor Range to the west and the marine air that enters the Central Valley through the Carquinez Strait and Altamont Pass in the Bay Area to the north. During the summer, marine air entering the Central Valley results in northeasterly winds in the daytime hours. In the nighttime hours downslope drainage of air from the hills and mountains to the south and west results in winds from the southwest. This windflow pattern is fairly consistent

throughout the year, although there is more variability to wind directions during the winter with the passage of storms through the area. Winds are usually of higher speeds during the summer because during the winter, calm and stagnant atmospheric conditions can occur between storms and the influence of the marine air from the coast is significantly diminished.

Along with the winds, another climatic factor is atmospheric stability and mixing height. Atmospheric stability is an indicator of the air turbulence and mixing. During the daylight hours of the summer when the earth is heated and air rises, there is more turbulence, more mixing and thus less stability. During these conditions there is more air pollutant dispersion and therefore usually fewer air quality impacts from a single air pollution source like the LPGP. During the winter months between storms, very stable atmospheric conditions occur, resulting in very little mixing. Under these conditions, little air pollutant dispersion occurs, and consequently higher air quality impacts result from stationary source emissions. Mixing heights are generally lower during the winter, along with lower mean wind speeds and less vertical mixing.

EXISTING AIR QUALITY

The Federal Clean Air Act and the California Air Resources Board (CARB) both required the establishment of allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by CARB, are typically lower (more protective) than the federal AAQS, which are established by the EPA. The state and federal air quality standards are listed in AIR QUALITY Table 1. As indicated in AIR QUALITY Table 1, the averaging times for the various air quality standards (the duration over which they are measured) range from one-hour to an annual average. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant in a cubic meter of air (mg/m^3 and $\mu\text{g}/\text{m}^3$).

In July 1997, the EPA promulgated new ozone and PM_{2.5} (particulate matter less than 2.5 microns in diameter) ambient air quality standards, which are shown in AIR QUALITY Table 1. The new 8-hour ozone standard will replace the existing 1-hour standard. The PM_{2.5} standards will be in addition to the existing PM₁₀ standards. Although the standards may be set, the EPA will first have to designate areas which violate these new standards, and then air districts that violate these standards will have to prepare implementation plans to reach attainment of those standards.

In general, an area is designated as attainment for a specific pollutant if the concentrations of that air contaminant do not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that standard is violated. Where not enough ambient data are available to support designation as either attainment or non-attainment, the area can be designated as unclassified.

Unclassified areas are normally treated the same as attainment areas for regulatory purposes. An area can be attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same contaminant. The entire area within the boundaries of a district is usually evaluated to determine the district's attainment status.

AIR QUALITY Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O ₃)	1 Hour	0.12 ppm (235 µg/m ³)	0.09 ppm (180 µg/m ³)
	8 Hour	0.08 ppm (157 µg/m ³)	---
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)
	1 Hour	35 ppm (40 mg/m ³)	20 ppm (23 mg/m ³)
Nitrogen Dioxide (NO ₂)	Annual Average	0.053 ppm (100 µg/m ³)	---
	1 Hour	---	0.25 ppm (470 µg/m ³)
Sulfur Dioxide (SO ₂)	Annual Average	80 µg/m ³ (0.03 ppm)	---
	24 Hour	365 µg/m ³ (0.14 ppm)	0.04 ppm (105 µg/m ³)
	3 Hour	1300 µg/m ³ (0.5 ppm)	---
	1 Hour	---	0.25 ppm (655 µg/m ³)
Respirable Particulate Matter (PM ₁₀)	Annual Geometric Mean	---	30 µg/m ³
	24 Hour	150 µg/m ³	50 µg/m ³
	Annual Arithmetic Mean	50 µg/m ³	---
Fine Particulate Matter (PM _{2.5})	24 Hour	65 µg/m ³	---
	Annual Arithmetic Mean	15 µg/m ³	---
Sulfates (SO ₄)	24 Hour	---	25 µg/m ³
Lead	30 Day Average	---	1.5 µg/m ³
	Calendar Quarter	1.5 µg/m ³	---
Hydrogen Sulfide (H ₂ S)	1 Hour	---	0.03 ppm (42 µg/m ³)
Vinyl Chloride (chloroethene)	24 Hour	---	0.010 ppm (26 µg/m ³)
Visibility Reducing Particulates	1 Observation	---	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

The LPGP is located in the Kern County portion of the San Joaquin Valley Air Basin and, as stated above, is under the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District. This area is designated as non-attainment for both the state and the federal ozone and PM₁₀ standards, attainment for the state's CO, NO₂, SO₂, SO₄ and Lead standards, attainment for the federal SO₂ standard, and unclassified/attainment for the federal CO and NO₂ standards (ARB 1998).

Ambient air quality data has been collected by the oil companies, known as the Westside Operators, in western Kern County for a number of years. Ambient air quality data collected between 1993 and 1995 at the Westside Operators Fellows site, located approximately 9 miles south-southeast of the project site is presented in AIR QUALITY Table 2. That data shows there have been no violations during that period of the NO₂, SO₂ or CO ambient air quality standards.

Additional ambient air quality data from the Air Resources Board's ozone monitor in Maricopa (20 miles to the southeast of the project site) and Taft College PM₁₀ monitor (14 miles to the southeast of the project site) are shown in AIR QUALITY Table 3. This data shows that frequent violations of the state 1-hour ozone and 24-hour PM₁₀ standard have occurred between 1993 and 1997. There appears to be no clear trend of significant improvement in the ambient concentrations of these two pollutants.

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants. Nitrogen oxides (NO_x) and hydrocarbons (Volatile Organic Compounds [VOCs]) interact in the presence of sunlight to form ozone. The collected air quality data indicate that the ozone violations occurred primarily during the period of May through October.

In the most recent ARB report on the contribution of various districts to ozone violations in other districts (ARB 1996), the San Joaquin Valley Air Basin contributes measurably to ambient ozone levels in other districts, as well as other districts contributing measurably to the San Joaquin Valley's ozone problems. The report concludes that sources within the San Joaquin Valley Air Basin contribute to ozone levels in Mountain County districts to the northeast, the South Central Air Basin to the south, to the Mojave Desert to the east, the Sacramento area to the north, the Great Basin Valleys to the east, and to the North Central Coast Air Basin to the west. Conversely, emissions from districts such as the San Francisco Bay Area and the Sacramento area contribute to San Joaquin Valley's ozone problems. This widespread contribution from one geographic area to another demonstrates the regional nature of the ozone problem and ozone formation.

AIR QUALITY Table 2
PM10, NO2, CO and SO2 Ambient
Air Quality Data Collected at Fellows

Pollutant	Averaging Time	1995	1994	1993	Most Restrictive Ambient Air Quality Standard
PM10	24 hours	80	85	109	50
	Annual	24.6	25.9	31.0	30
NO2	1 hour	62	94	92	470
	Annual	12.6	14.4	16.6	100
CO	1 hour	2440	2303	2941	23,000
	8 hour	1869	1985	2222	10,000
SO2	1 hour	65	94	36	655
	3 hours	36	57	27	1300
	24 hours	13	20	14	130
	Annual	1.5	1.8	1.8	80

AIR QUALITY Table 3
Ozone and PM10 Ambient Air Quality Data

Pollutant & Location		1997	1996	1995	1994	1993
Ozone Maricopa	Max. conc.(ppm)	.12	.12	.13	.13	.12
	# days exceed standard	24	63	57	11	17
PM10 Taft College	Max. conc ($\mu\text{g}/\text{m}^3$)	78	94	93	64	118
	# days exceed standard	6	12	15	6	13
	% of samples above 24-hour standard	10%	20%	25%	11%	23%
California Ozone Ambient Air Quality Standard: 0.09 ppm (1-hour average) National Ozone Ambient Air Quality Standard: 0.12 ppm (1-hour average) California PM10 Ambient Air Quality Standard: 50 $\mu\text{g}/\text{m}^3$ (24-hour average)						

AMBIENT PM10

As Table 3 indicates, the project area also annually experiences a number of violations of the state 24-hour PM10 standard, although violations of the federal 24-hour standard are not occurring. The violations of the state 24-hour standard occur predominately between the months of August and February, with the highest number of violations occurring from September through November.

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SOx and VOC from turbines, and ammonia from NOx control equipment can, given the right meteorological conditions, form particulate matter known as nitrates (NO3), sulfates (SO4), and organics. These pollutants are known as secondary particulates, because they are not directly emitted but are formed through complex chemical reactions in the atmosphere.

A number of studies have been undertaken to understand the particulate phenomenon, both PM10 and the smaller PM2.5, in the San Joaquin Valley. La Paloma has undertaken an extensive review of the literature to specifically address the role of nitrogen oxides emissions in the formation of particulate matter (Sylte 1999). Major sources of information on the subject are available from the District and CARB. La Paloma has concluded the following about the NOx/PM10 relationship:

- NOx emissions contribute significantly to the formation of particulate nitrate in the region where the LPGP is located, and
- ammonium nitrate is the largest contributor to PM10 levels during the winter when ambient PM10 levels are at there highest.

Staff's assessment of the NOx contribution to particulate nitrate formation (CARB 1993-1997) (Chow et al. 1993) corroborates La Paloma's conclusion; that emissions of gaseous NOx emissions can contribute a substantial portion of the ambient particulate nitrate in the southern San Joaquin Valley, especially during the winter season when the PM10 levels are the highest.

PROJECT DESCRIPTION AND EMISSIONS

CONSTRUCTION

The LPGP will include not only the power plant, but the following ancillary facilities as well:

- a water supply pipeline pumping station located adjacent to the California Aqueduct,
- an eight mile long, 24-inch diameter raw water supply line from the pumping station to the project site,
- a 700,000 gallon water storage tank along the raw water supply line approximately 1.5 miles from the project site,
- a 9,000 foot long, 6-inch diameter, potable water supply line from the West Kern Water District supply line in McKittrick,
- a three-well waste water injection wellfield located on the power plant site,
- a 370 foot long, 20-inch diameter natural gas tap line to the Kern/Mojave pipeline, and
- a 14.2 mile long double circuit transmission line from the project to the Midway Substation to the north.

The construction of facilities will generate air emissions, primarily fugitive dust from earth moving activities and combustion emissions generated from the construction equipment and vehicles. The projected highest daily emissions, based on the highest monthly emissions over the 24 month construction activity are shown in AIR QUALITY Table 4. It should be noted that the emissions shown in Table 4 would likely not occur on one single day. For example, the highest NOx emissions for the project site activity occur during month 11, while the highest NOx emissions for the raw water and pumping station activity occur during month 14.

AIR QUALITY Table 4
Maximum Daily Construction Emissions (lb/day)

	NOx	VOC	CO	PM10	Fugitive PM10
Project Site	1262.1	152.1	920.9	89.5	62.7
Borrow Fill for Project Site	28.0	4.4	26.0	31.7	0.3
Water Pipeline & Pumping Station.	491.2	94.8	34.1	24.4	negligible
Transmission Line	287.1	62.0	27.8	20.4	negligible
Potable Water Line & Injection wells	336.2	94.0	33.7	24.0	negligible
Water Storage Tank ^a	152.2	19.4	116.5	40.7	28.7
Notes: All activities based on an 8 hour workday ^a Maximum daily emissions include construction activity as well as removal of material from the tank site.					

PROJECT SITE

The power plant itself will take approximately two years to construct. The power plant project construction itself consists of three major areas of activity: 1) the civil/structural construction 2) the mechanical construction, and 3) the electrical construction. The largest air emissions are generated during the civil/structural activity, where work such as grading, site preparation, foundations, underground utility installation and building erection occur. These types of activities require the use of large earth moving equipment, which generate considerable combustion emissions themselves, along with creating fugitive dust emissions. The mechanical construction includes the installation of the heavy equipment, such as the combustion and steam turbines, the heat recovery steam generators, condenser, pumps, piping and valves. Although not a large fugitive dust generation activity, the use of large cranes to install such equipment generates significantly more emissions than other construction equipment onsite. Finally, the electrical equipment installation occurs involving such items as transformers, switching gear, instrumentation and wiring. This is a relatively small emissions generating activity in comparison to the early construction activities.

Not surprisingly, the largest level of construction emissions for the project will occur from the project site activity, most of it due to earth moving and grading activities and large crane operations.

BORROW SOIL SITE

For grading at the project site, approximately 7,000 cubic yards of soil will be needed. This soil will come from an offsite location, which at this point has not been identified. La Paloma has identified one possible source known as Coopers Pit, located approximately 10 miles west of the project site along Highway 58 (LPGP 1998b). In order to deliver the necessary fill material, approximately 48 round trip truck deliveries will take place over the course of nine days. The combustion emissions and fugitive PM10 emissions associated with the transport of the borrow soil are summarized in AIR QUALITY Table 4, which assumes that the borrow soil site would be approximately 10 miles away from the project site.

WATER PIPELINE AND AQUEDUCT PUMPING STATION

The construction of the raw water pipeline and pumping station includes the activities of clearing and grading, trenching, stringing the pipes and fittings, lining and connecting, and backfill and clean-up. The emissions generating equipment include one or two bulldozers, one motorgrader, one or two backhoes, a trenching machine and a sideboom tractor. The one-half acre site for the aqueduct pumping station will require some excavation and backfill, along with the installation of the pumps themselves. The planned construction schedule for this activity is between the 9th and 14th month of the 24-month schedule.

The maximum daily emissions from the construction of the raw water and aqueduct pumping station is shown in AIR QUALITY Table 4.

The construction of the raw water pipeline and pumping station will require much less in emissions generating equipment than that necessary for the power plant itself.

WATER STORAGE TANK

The construction of the water storage tank along the raw water pipeline will take about three months and be concurrent with the raw water pipeline construction schedule. The land area disturbed will be approximately one-half an acre and will require the excavation of approximately 5,000 cubic yards of earth material at the site. Some of this material may be used as fill for the project site and/or the pump station turnout site. The emissions associated with the construction of the water storage tank are shown in AIR QUALITY Table 4 (LPGP 1998c).

POTABLE WATER AND WELL INJECTION FIELD

The construction of the short potable water supply pipeline will use similar equipment as the larger raw water pipeline, although there should be less equipment involved because of its small diameter and shorter distance. The schedule for the installation of this water line is between the 4th and 5th month.

The construction of the well injection field will require about the same numbers and types of equipment as the raw water pipeline and will be in the same area as the power plant project itself. The planned construction of this well field will be between the 11th and 15th month of the construction schedule.

The maximum emissions from the activities associated with the construction of the potable water line and the well injection field are shown in AIR QUALITY Table 4. The highest emissions are from the well injection field construction activity.

TRANSMISSION LINE

The construction of the transmission line is planned to take approximately 8 months between the 12th and 20th month of the project construction schedule. The significant emissions generating vehicles are the trucks used to deliver the transmission tower structural materials, boom trucks and mobile cranes. Maximum emissions from the transmission line construction are shown in AIR QUALITY Table 4.

TEMPORARY HRSG CHEMICAL CLEANING BOILER

During the initial commissioning phase of the project operation, each heat recovery steam generator (HRSG) will undergo a chemical cleaning, called a "boilout", using a temporary mobile boiler. This natural gas boiler, of approximately 250

horsepower, will be used for approximately 3 days for each HRSG. Emissions for this boiler are shown in AIR QUALITY Table 5.

AIR QUALITY Table 5
Temporary HRSG “Boilout” Chemical Cleaning Boiler Emissions

Time Periods	NOx	SO2	PM10	VOC	CO
Hourly - lb./hour	0.44	0.021	0.11	0.05	0.69
Daily – lb./day	10.6	0.504	2.6	1.2	16.4
Monthly (Total of 12 days of operation) – lbs/12 days	127.2	6.05	31.2	14.4	196.8

OPERATIONAL PHASE

EQUIPMENT DESCRIPTION

- The major components of the LPGP consist of the following: Four combustion turbine generators (CTG), using the Asea Brown Boveri (ABB) Model GT 24, nominally rated at 171.1 MW. Each of the CTGs would be equipped with evaporative inlet air coolers;
- Four unfired heat recovery steam generators (HRSG) and ancillary equipment;
- Four steam turbines, each rated at 96 MW;
- Two ten-cell cooling towers;
- One diesel fuel fired fire water pump; and
- Four diesel fuel fired emergency power pumps.

EQUIPMENT OPERATION

The CTGs will burn only natural gas, and there are no provisions for an alternative back-up fuel.

La Paloma is requesting that the project be analyzed with the assumption of 50 start-ups per turbine each year. There are, however, various durations of start-up of the CTGs, depending on length of time that the turbine has been shutdown and the temperatures and pressures on the steam turbine side of the power generation block. The usual practice is to define start-ups as either a hot start, a warm start or a cold start, with the start-up period being defined as the length of time until the gas turbine is fully loaded, that is, producing baseload electrical power. A hot start would occur after an overnight turbine shutdown. The duration of a hot start is

relatively short, approximately half an hour. A warm start-up is also approximately 30 minutes in duration, although the steam turbine ramping up period would be longer than a hot start. A warm start-up duration would occur after a typical weekend shutdown (approximately 60 to 72 hours). A cold start takes considerably longer, on the order of two hours. However, this type of start-up would be very rare, occurring only after the turbines have been under extended shutdown, such as the annual maintenance inspection that the manufacturer may require. Because of the thermal efficiency of the project, it is highly likely that the LPGP will operate extensively, therefore extended shutdowns are likely to be rare.

La Paloma has requested the project be analyzed assuming, that of the 50 start-ups per turbine each year, 10 start-ups be defined as cold start and 40 defined as warm or hot start-ups. Staff believes that the more likely scenario is that, barring major mechanical malfunction of the equipment itself, cold start-ups may occur once or twice a year, most likely during the annual maintenance and inspection. Staff would expect that the vast majority of start-ups would be hot or warm starts, thus minimizing start-up periods of time.

The diesel-fired emergency fire water pump will only operate if the electric motor pump fails to start or the pressure in the fire water distribution header drops below a certain set point. To be sure that this fire water pump is ready to operate, La Paloma intends to operate the diesel engine once a week for one hour.

In addition to the emergency fire water pump, there will be four diesel-fueled emergency generators. These Caterpillar generators, either 300 kW or 320 kW, will be used in the event of a power grid outage. Coincidentally, the CTGs would be down. In order to maintain lube oil circulation in the CTGs, the turbine shafts will be rotated with these four generators. It is very unlikely that these four generators would actually have to operate as intended. However, to be sure they are available as needed, La Paloma has proposed that each of the four would be test-fired once a month, presumably for approximately one hour for each engine test.

EMISSION CONTROLS

The exclusive use of an inherently clean fuel, natural gas, will limit the formation of SO₂ and PM₁₀ emissions. Natural gas contains very small amounts of a sulfur compound known as mercaptan, which when combusted, results in sulfur dioxide emissions in the flue gas. However, in comparison to other fuels used in power plants, such as fuel oil or coal, the sulfur dioxide emissions from the combustion of natural gas are very low.

Like SO₂, the emissions of PM₁₀ from natural gas combustion are very low compared to the combustion of fuel oil or coal. Natural gas contains very little noncombustible gas or solid residue; therefore it is a relatively clean-burning fuel.

A sulfur content of 0.75 grains of sulfur per 100 standard cubic feet of natural gas was assumed for the SO₂ emission calculations.

To minimize NO_x, CO and VOC emissions during the combustion process, the ABB GT-24 turbine is equipped with the latest dry low-NO_x combustor design developed by ABB,

called the Sequential Combustion System. A more detailed discussion of this combustion technology is presented in the Mitigation section of this analysis.

After combustion, the flue gases pass through the heat recovery steam generator (HRSG), where catalyst systems are placed to further reduce NO_x, CO and VOC emissions. La Paloma is proposing to use a Selective Catalytic Reduction (SCR) system to reduce NO_x emissions. Another catalyst, an oxidizing catalyst, will also be installed in the HRSG to reduce CO and VOC emissions. La Paloma is also exploring the possibility of installing a new catalyst technology, SCONOXTM, in lieu of the SCR and oxidizing catalyst in one of the four HRSGs. A more complete discussion of these catalyst technologies is included in the Mitigation section.

PROJECT OPERATING EMISSIONS

The proposed project's criteria air pollutant emissions during short periods of time, one hour or less, are shown in AIR QUALITY Table 6. This table presents the combustion turbine, cooling tower and diesel fire pump back-up generator. As this table shows, the highest emissions are from the combustion turbine, with the emissions during startup and shutdown being significantly higher than during steady state, full load operation. Most notably, emissions of NO_x, VOC and CO are significantly higher during startup and shutdown. These higher emissions occur because the turbine combustor technology is designed for maximum efficiency during full load steady state operation.

AIR QUALITY Table 6
Project (Per CTG) Hourly Emissions
(pounds per hour [lb/hr] except where noted)

Operational Profile	NO_x	SO₂	PM₁₀	VOC	CO
CTG Cold Start-up (100 minutes)	72	0.9	24.1	72	1185
CTG Warm Start-up (30 min)	44	0.3	5.6	39	600
CTG Hot Start-up (30 min)	21	0.3	5.6	15	150
Shutdown (23 minutes)	63	0.3	4.8	9.9	223
CTG Steady State @ 100% load at 15°F	17.54	3.73	17.2	2.67	21.08
CTG Steady State @ 100% load at 65°F	16.26	3.42	16.0	2.59	19.88
Cooling Towers	--	--	0.94	--	--
Emergency Generator (one)	7.2	--	0.4	1.1	8.9
Emergency Fire-water Pump	5.4	0.4	0.1	0.2	1.0
4 CTGs at Steady State at 65° F & Cooling Tower	65.04	13.92	64.94	10.36	79.52

During startup and shutdown, combustion temperatures and pressures are rapidly changing, which results in less efficient combustion and higher emissions. Also, the flue gas controls, the catalysts discussed above, operate most efficiently when the turbine operates near or at full load. Those flue gas controls are not as effective during the

transitory temperature changes that occur during startup and shutdown. The start-up emissions data reflect information provided by ABB (ABB 1998) that are believed to be more realistic than start-up data previously submitted in the AFC. La Paloma has agreed that their project would be analyzed based on this recent ABB start-up data.

The daily emissions from the project are shown in AIR QUALITY Table 7. The table shows different operating scenarios, and the resultant emissions, including CTG startup (cold, warm and hot), shutdown, and steady state operation. The operation of the cooling tower, diesel fueled emergency fire pump and generators are also included. A highest daily emissions level scenario is presented in the last row of the table.

**AIR QUALITY Table 7
Project Daily Emissions
(pounds per day [lb/day])**

Operational Profile	NOx	SO2	PM10	VOC	CO
4 turbine sequential cold-start and steady state operation	1523.76	268.08	1312.4	484.84	6250.88
4 turbine sequential warm start and steady state operation	1655.66	320.28	1552.4	391.69	4209.08
4 turbine sequential hot start and steady state operation	1563.66	320.28	1552.4	295.69	2411.67
4 turbine 24-hr steady state full load operation	1560.96	328.7	1536.0	248.64	1908.48
Cooling towers operating 24-hr	--	--	22.48	--	--
4 emergency generators	28.8	--	1.6	4.2	35.6
Emergency fire-water pump operating 1 hour	5.4	0.4	0.1	0.2	1.0
Typical daily operation - 4 turbines operate full load and cooling towers	1560.96	328.7	1558.48	248.64	1908.48

Annual emissions are summarized in the AIR QUALITY Table 8. La Paloma has requested that the project be analyzed assuming 10 cold start-ups per turbine per year, and 40 warm or hot start-ups per turbine per year. The balance of the year's operation assumes full load operation of the CTGs. This type of operational scenario is actually not possible, since by definition, the start-ups must be preceded with no turbine operation and thus no emissions. In the case of the ten cold start-ups, the turbines would have to be down for many days before a cold start would be initiated. Therefore, the assumption of 8720 hours of steady state operation could not happen.

For comparison, staff has presented the scenario of all four turbines operating non-stop throughout the year. The highest annual emissions of SO2 and PM10 would occur with this scenario, since those emissions are a function of the quantity of fuel burned. The annual emissions of NOx, VOC and CO would be higher with the inclusion of the start-

up emissions. Also included in Table 8 are the total Initial Commissioning emissions which, not surprisingly, are not insignificant in comparison to the likely commercial operation annual emissions.

**AIR QUALITY Table 8
Project Annual Emissions
(tons per year [ton/yr])**

Operational Profile	NOx	SO2	PM10	VOC	CO
10 cold starts, 40 warm starts, remainder steady state ^a	289.42	59.70	284.12	49.85	419.36
Steady state operation entire year ^b	285.76	60.00	284.47	45.50	349.25
Initial Commission Phase - 4 1/2 mos. operation	135	NA	20	56	431
Notes: ^a Assume 20 hr cold start, 20 hr warm start, 8720 hr steady state, 8760 hours cooling towers operation, 52 hours each for fire-water pump and four emergency generators ^b Assume 8760 hr steady state for four turbines and cooling towers and 52 hours each for fire-water pump and four emergency generators					

AMMONIA EMISSIONS

Due to the large combustion turbines used in this project and the need to control NOx emissions, significant amounts of ammonia will be injected into the flue gas stream as part of the SCR system. Not all of this ammonia mixes in the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted unaltered, out the stacks. These ammonia emissions are known as ammonia slip. La Paloma has committed to an ammonia slip no greater than 10 ppm, which is the current lowest ammonia slip level being achieved and permitted throughout California. On a daily basis, the ammonia slip of 10 ppm is equivalent to approximately 2,333 lb./day of ammonia emitted into the atmosphere. This level of emissions is based on all four HRSGs installed with SCR, however one of the HRSGs may be installed with SCONOXTM, which does not require ammonia injection.

It should be noted that the ammonia slip of 10 ppm is usually associated with the degradation of the SCR catalyst, usually in a time frame of five years or more after initial operation. At that point, the SCR catalysts are removed and replaced with new catalysts. Through most of the operation of the SCR system, ammonia slip emissions are usually in the range of 1 to 2 ppm, corresponding to a mass emissions in the LPGP case to approximately 200 to 500 pounds per day. The implications of these ammonia emissions are discussed later in this analysis.

INITIAL COMMISSIONING PHASE OPERATION AND EMISSIONS

Prior to the first firing of the combustion turbines, the temporary HRSG boilout chemical cleaning boiler will be used. The combustion turbines will then undergo the initial firing and commissioning phase of the project schedule. La Paloma is requesting that up to 4 1/2 months for each turbine be considered as the initial commissioning phase of the

project's operation. During this period, emissions may exceed permitted levels, due to start-ups, shutdowns, extended periods of low load operation and periods of time when the low-NOx burners and SCR systems will need to be fine tuned for optimum performance.

Over each 4 1/2 month period, La Paloma estimates that each CTG will operate approximately 740 hours and undergo approximately 5 cold starts, 25 hot starts and 30 shutdowns. The emissions associated with this initial commissioning phase are shown in AIR QUALITY Table 8. The highest emissions occur because of extended periods of partial load operation, where emissions of CO, in particular, would be expected to be higher. It should be noted that it is in the owner's best interest to minimize this initial commissioning phase in order for the project to be declared ready for commercial operation and thus able to generate revenues. Therefore, it is expected that this initial commissioning phase will, to the extent feasible, be as short as possible and thus minimize the higher than normal operations emissions that are inevitable during the necessary testing.

The District stated in a recent letter (SJVUAPCD 1999) that "...no relief from the permit conditions during initial commissioning were proposed or will be included in our conditions of approval." They go on to say that La Paloma may use the District's equipment breakdown and variance procedures that can offer relief from permit conditions if violations of limits do occur. Based on the emissions information currently provided by La Paloma, it is highly likely that during the initial commissioning phase of operation of the project, that excursions of the permit limits will occur and that La Paloma will have to file for a variance during the initial commissioning phase.

FACILITY CLOSURE

Eventually the LPGP will close, either as a result of the end of its useful life, or through some unexpected situation such as a natural disaster or catastrophic

facility breakdown. When the facility closes, then all sources of air emissions would cease and thus all impacts associated with those emissions would no longer occur.

The Permit to Operate, issued by the District under Rule 2010, is required for operation of the facility and is usually renewed on a five year schedule. However, during those five years, the applicant must still pay permit fees annually. If the applicant chooses to close the facility and not pay the permit fees, then the Permit to Operate would be cancelled. In that event, the project could not restart and operate unless the applicant pays the fees to renew the Permit to Operate.

If La Paloma were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. District Rule 8020 requires that during demolition that fugitive dust emissions be limited to no greater than 40% opacity by means of water application or chemical suppressants. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager should include the specific details regarding how La Paloma plans to demonstrate compliance with the District Rule 8020.

PROJECT INCREMENTAL IMPACTS

MODELING APPROACH

Staff performed an air dispersion modeling analysis to evaluate the project's potential impacts on the existing ambient air pollutant levels, both during construction and operation. An air dispersion modeling analysis usually starts with a conservative screening level analysis. Screening models use very conservative assumptions, such as the meteorological conditions, which may or may not actually occur in the area. The impacts calculated by screening models, therefore, can be double or more than the actual or expected impacts. If the screening level impacts are significant, refined modeling analysis is performed. A major difference in the refined modeling is that hour-by-hour meteorological data collected in the vicinity of the project site is used. The Industrial Source Complex Short-Term model, Version 3, known as the ISCST3 model, was used for the refined modeling.

CONSTRUCTION IMPACTS

La Paloma performed air dispersion modeling analyses of the potential construction impacts at the project site. The analyses included fugitive dust generated from the construction activity (modeled as an area source) and combustion emissions from the equipment (modeled as four point sources). The emissions used in the analysis were the highest emissions of a particular pollutant during a one month period, converted to a gram per second emission rate for the model. Most of the highest emissions occurred about halfway through the 24-month construction period.

The results of this modeling effort are shown in AIR QUALITY Table 9. They show that the construction activities would cause a violation of the state 1-hour and annual average NO₂ standards and further exacerbate existing violations of the state 24-hour and annual average PM₁₀ standards. In reviewing the modeling output files, the project's construction impacts are not occasional or isolated events, but are over an area within a few hundred meters of the project site. These predicted impacts are of such a high magnitude for a number of reasons.

First, the model itself calculates impacts that are very conservative, usually exceeding actual impact levels by a considerable margin. Second, the analysis assumes that all the NO_x emitted from the vehicles is in the form of NO₂. In reality, approximately 90 percent of NO_x emissions from a combustion source are in the form of nitrogen oxide (NO), and eventually that NO would oxidize to NO₂. Therefore, the NO₂ impact shown in the modeling analysis does not realistically reflect the possible NO₂ impacts.

AIR QUALITY Table 9
Maximum Construction Impacts

Pollutant	Averaging Time	Impact (µg/m ³)	Background (µg/m ³)	Total Impact (µg/m ³)	Limiting Standard (µg/m ³)	Percent of Standard
NO ₂	1-hour	9474	94	9568	470	2036
	Annual	84	16.6	100.6	100	101
CO	1-hour	9218	2941	12159	23,000	53
	8-hour	3496	2222	5718	10,000	57
SO ₂	3-hour	564	57	621	1300	48
	24-hour	33	20	53	130	41
	Annual	7.3	1.8	9.1	80	11
PM ₁₀	24-hour	144	118	262	50	524
	Annual	24	31.7	55.7	30	186

Third, some of the sources of combustion emissions (the bulldozers and trucks) are mobile sources, not stationary sources as input into the model. Therefore, as mobile sources, the air quality impacts would not always be at the same locations, so the model results are overstated. Fourth, it was assumed that all the equipment identified for the modeling evaluation would be running simultaneously. It is doubtful that all the major equipment, 4 large bulldozers, 4 backhoes, 12 cranes

and 5 large flatbed trucks would all be operating at one time, and thus the impacts are overstated.

Finally, the emissions inputs to the model were from the highest monthly emissions assumed during the 2-year construction period. The levels of emissions used reflect a period of activity of approximately one year, not the entire two year construction. During the other months of construction work, considerably fewer emissions generating equipment will be used and thus the impacts will be lower.

Although construction of the LPGP will result in unavoidable short-term impacts, it is doubtful that the general public would be exposed to the construction impacts associated with the project. This is because of the project's rather isolated location away from any population centers in a heavily industrial area (the surrounding oilfields), where the impacts would actually occur. Nevertheless, staff believes that the impact from the construction of the project could have a significant and unavoidable impact on the NO₂ and PM₁₀ ambient air quality standards, and should be avoided or mitigated, to the extent feasible.

PROJECT OPERATION IMPACTS

The air quality impacts of project operation are shown in the following sections for fumigation meteorological conditions, and during combustion turbine start-up and steady-state operations.

FUMIGATION IMPACTS

During the early morning hours before sunrise, the air is usually very stable. During such stable meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed. When the sun first rises, the air at ground level is heated, resulting in a vertical (both rising and sinking air) mixing of air for a few hundred feet or so. Emissions from a stack that enter this vertically mixed layer of air will also be vertically mixed, bringing some of those emissions down to ground level. Later in the day, as the sun continues to heat the ground, this vertical mixing layer becomes higher and higher, and the emissions plume becomes better dispersed. The early morning air pollution event, called fumigation, usually lasts approximately 30 to 90 minutes.

The applicant used the SCREEN3 model, which is an EPA approved model, for the calculation of fumigation impacts. AIR QUALITY Table 10 shows the modeled fumigation results and impacts on the 1-hour NO₂, CO and SO₂ standards. Since fumigation impacts will not typically occur much beyond a 1-hour period, only impacts on these 1-hour standards were addressed. The results of the modeling analyses show that fumigation impacts at either partial load (50 percent) or full load will not violate the NO₂, CO or SO₂ 1-hour standards.

AIR QUALITY Table 10
CTG Fumigation Modeling Maximum 1-Hour Impacts

Pollutant	% Load of Turbines	Impact ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Impact ($\mu\text{g}/\text{m}^3$)	Limiting Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard
NO ₂	50	11.1	94	105.1	470	22
	100	13.3	94	107.3	470	23
CO	50	27.6	2941	2968.6	23,000	13
	100	16.3	2941	2957.3	23,000	13
SO ₂	50	2.5	94	96.5	655	15
	100	2.9	94	96.9	655	15
Notes: Modeling was performed at both 15°F and 65°F. Highest impacts occurred at 65°F, presented here.						

REFINED MODELING ANALYSIS

La Paloma provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project both during normal steady state operation and during start-up conditions. The results of this modeling analysis are shown in AIR QUALITY Table 11. This table shows that during normal operation of the combustion turbines, the air pollution impacts would not cause a violation of any NO₂, CO or SO₂ ambient air quality standards. All of the highest impacts were calculated to be located at the hills approximately 2,300 meters (about 1.5 miles) to the south of the project site.

The project's PM₁₀ impacts could contribute to existing violations of the state 24-hour and annual average PM₁₀ standards. The highest 24-hour PM₁₀ impacts ($10.8 \mu\text{g}/\text{m}^3$) are relatively large, about 1/5 the state standard itself, located on the hills to the south of the project site. However, it should be noted that the modeling outputs show that the vast majority of 24-hour impacts are on the level of $2 \mu\text{g}/\text{m}^3$ or less and are located in the flat terrain in the vicinity of the project site. Because of the conservatism of the air dispersion model itself, staff believes that the actual impacts from the project would be significantly less than the projected modeled impacts shown in AIR QUALITY Table 11.

The start-up circumstances of the project are such that the combustion turbines will be started sequentially; that is, there will be no simultaneous start-up of any of the four turbines. A start-up sequence of a turbine will only occur when other turbine(s) are operating at steady state or other turbines are not operating at all. Start-up

AIR QUALITY Table 11
Combustion Turbine Refined Modeling Maximum Impacts

Pollutant	Project Operation, load, and ambient temperature	Averaging Time	Impact ($\mu\text{g}/\text{m}^3$)	Back-Ground ($\mu\text{g}/\text{m}^3$)	Total Impact ($\mu\text{g}/\text{m}^3$)	Limiting Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard
NO ₂	4 turbines, 100%, 65°F	1-hour	99.0	94	193	470	41
	2 turbines start-up, 2 turbines 100%, 15°F	1-hour	251.1 with OLM	94	345.1	470	73
	4 turbines, 100%, 65°F	Annual	0.66	16.6	17.3	100	17
CO	4 turbines, 100%, 65°F	1-hour	121.0	2941	3062	23,000	13
	2 turbines start-up, 2 turbines 70% load, 15°F	1-hour	4823.8	2941	7764.8	23,000	34
	4 turbines start-up, then 100% load, 65°F	8-hour	98.5	2222	2320.5	10,000	23
SO ₂	4 turbines, 100%, 15°F	1-hour	23.0	104	127	655	19
	4 turbines, 100%, 15°F	3-hour	13.2	53	66.2	1300	5
	4 turbines, 100%, 65°F	24-hour	2.3	17	19.3	130	15
	4 turbines, 100%, 65°F	Annual	0.1	1.8	1.9	80	2
PM ₁₀	4 turbines, 100% & cooling tower, 65°F	24-hour	10.8	118	128.8	50	258
	4 turbines, 100% & cooling tower, 65°F	Annual	0.7	31.7	32.4	30	108

circumstances can be troublesome for significant air quality impacts for the following reasons. First, emissions (particularly of NO_x and CO) can be high and often uncontrolled, because emission control equipment is not operating at optimum temperature ranges. Second, low volumetric flow rates and exhaust gas temperatures can result in low exhaust plume rise and consequently higher ground

level impacts. For determining the maximum 1-hour impacts, La Paloma assumed that there would be two start-up sequences, each of 30 minutes, for two turbines plus the steady state operation of the two other turbines. The start-up emissions used in the modeling analysis are not the emissions presented earlier in the analysis, but rather emissions that are reflected in the permit conditions, that is, 160 lb/hr for NO_x and 2500 lb/hr for CO. These figures were proposed by La Paloma as limits that they would agree to as permit limits during start-up. These figures represent upper bounds in emissions and the modeling analysis shows that even at these levels, the project would not cause a violation of either the 1-hour NO_x or CO ambient air quality standards.

The modeling results show that the highest short-term impacts on ambient NO₂ and CO levels do, indeed, occur during start-up circumstances. The highest SO₂ and PM₁₀ impacts, both short-term and long term, occur during full load steady state operation. Start-up impacts on these pollutants are usually less because emissions of SO₂ and PM₁₀ are primarily a function of volume of fuel burned, and thus during start-up, much less fuel is burned than at full load, hence lower impacts.

The modeling analysis above indicates that during a project start-up scenario, the impacts from that start-up, plus background NO₂ ambient levels, would result in the highest impact of the project on the 1-hour state NO₂ standard. This modeling analysis reflected the use of the Ozone Limiting Method (OLM) to provide a more refined estimate of NO₂ impacts.

La Paloma also provided an ISCST3 modeling analysis of the operation of the diesel fueled emergency fire water pump operation. Since the fire water pump is only planned to operate for up to one hour, the air quality impacts are assessed only for the one hour standards. The results of this modeling analysis are described in AIR QUALITY Table 12, which shows that the operation of the fire water pump will not violate any ambient air quality standards. Staff would expect comparable results of the monthly testing of each of the four diesel emergency generators because of the similarities of the combustion engines.

AIR QUALITY Table 12
Emergency Fire Water Pump Modeling Maximum 1-Hour Impacts

Pollutant	Impact ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Impact ($\mu\text{g}/\text{m}^3$)	Limiting Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard
NO ₂	216.9	94	310.9	470	66
CO	38.3	2941	2979.3	23,000	13
SO ₂	16.1	104	120.1	655	18
Notes: 1) Modeling was performed at both 15°F and 65°F. Highest impacts occurred at 65°F, presented here. 2) NO ₂ impact does not reflect ozone limiting analysis and are thus conservative.					

SECONDARY POLLUTANT IMPACTS

The project's emissions of gaseous emissions, primarily NO_x, SO₂ and VOC, can contribute to the formation of secondary pollutants, namely ozone and PM₁₀, particularly ammonium nitrate PM₁₀ and sulfate. There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NO_x and VOC emissions to ozone formation, it can be said that the emissions of NO_x and VOC from the LPGP do have the potential (if left unmitigated) to contribute to higher ozone levels in the region.

Concerning secondary PM₁₀ (primarily ammonium nitrate) formation, La Paloma (LPGP 1999a) submitted a conclusion from a study by Sonoma Technology, Inc. which states that the San Joaquin Valley is generally ammonia rich during the winter season when ambient PM₁₀ levels are highest. This means that under such conditions, adding more ammonia to the ambient air will not automatically result in more ammonium nitrate formation. In the case of LPGP, La Paloma quantified the highest ammonia emissions at approximately 2,300 pounds per day based on a permitted 10 ppm ammonia slip. However, staff believes that these mass emissions will be more on the order of 200 to 500 pounds per day based on a normal 1 to 2 ppm ammonia slip. Nevertheless, the NO_x emissions from the LPGP could add to ammonium nitrate (PM₁₀) formation, since there is more than sufficient ambient ammonia available for the NO_x to react with to form ammonium nitrate.

The process of gas-to-particulate conversion is complex and depends on many factors, including local humidity and the presence of other compounds. Currently, there are no agency (EPA or CARB) recommended models or procedures for estimating nitrate or sulfate formation. Nevertheless, studies during the past two decades have provided data on the oxidation rates of SO₂ and NO_x. The data from these studies can be used to approximate the conversion of SO₂ and NO_x to particulate. This can be done by using an aggregate conversion factor (typically about 0.01 to 1 percent per hour) with Gaussian dispersion models such as ISCST3. The model is run with and without chemical conversion (decay factor) and the difference corresponds to the amount of SO₂ and NO₂ that is converted to particulate. This approach is an over simplification of a complex process; nevertheless, given the stringency of the PM₁₀ and the new PM_{2.5} standards, and the need to address interpollutant conversion rates in setting offset ratios, for interpollutant trading, as proposed by LPGP, staff believes this issue needs to be addressed.

Staff, as part of their cumulative modeling analysis quantified, through air dispersion modeling and assumed NO_x and SO₂ conversion rates to PM₁₀, the potential secondary PM₁₀ impacts from the three power projects in the area

currently before the Commission for licensing: La Paloma, Sunrise Cogeneration and Elk Hills. Staff believes that the emissions of NO_x from LPGP do have the potential (if left unmitigated) to contribute, to higher secondary PM₁₀ (particularly of ammonium nitrate) levels in the region.

CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future projects as part of a cumulative impacts analysis, staff needs specific information. The time in which a probable future project is well enough defined to have the information necessary to perform a modeling analysis is usually when the project applicant has submitted an application to the District for a permit. Air dispersion modeling required by the District would necessitate that the applicant develop the necessary modeling input parameters to perform a modeling analysis. Therefore, we evaluate those probable future projects in our cumulative impacts analysis that are currently under construction, or are currently under District review. Projects located up to six miles from the proposed facility site usually need to be included in the analysis.

At the time of the filing of the AFC (July 1998), La Paloma stated that there were no projects that required a District permit within a six mile radius of the project site that were either under construction or undergoing permit review. However, since July, two new energy projects have been proposed in the vicinity of the LPGP. They are the Sunrise Cogeneration and Power Project that filed an AFC with the Energy Commission in December 1998 and the Sempra Elk Hills Project that filed an AFC in late February 1999. Staff has performed a cumulative modeling assessment of the three projects, La Paloma, Sunrise Cogeneration and the Elk Hills Project, with each project located approximately six miles from each other.

Staff used the ISCST3 air dispersion model along with the 1993 meteorological file provided by La Paloma. The results of this modeling analysis are shown in AIR QUALITY Table 13.

AIR QUALITY Table 13
Maximum Cumulative Impacts

Pollutant	Averaging Time	Impact (µg/m ³)	Background (µg/m ³)	Total Impact (µg/m ³)	Limiting Standard (µg/m ³)	Percent of Standard
NO ₂	1-hour	25.31	94	119.3	470	25
	Annual	0.34	16.6	16.9	100	17
CO	1-hour	30.46	2941	2971.5	23,000	13
	8-hour	7.72	2222	2229.7	10,000	22
SO ₂	24-hour	0.12	20	20.1	130	15
	Annual	0.02	1.8	1.8	80	2
PM ₁₀	24-hour	1.12	118	119.1	50	238
	Annual	0.17	31.7	31.9	30	106

As Table 13 shows, the cumulative air quality effects of the three projects do not cause a new violation of any NO₂, CO or SO₂ ambient air quality standards. The three

projects would contribute to already existing violations of the state PM10 ambient air quality standards. However, all three of these projects will be required to provide PM10 emission offsets to mitigate their PM10 impacts.

Staff also performed an assessment of the possible secondary PM10 formation of nitrates and sulfates from the three projects' NOx and SO2 emissions. For NOx to nitrate formation, a conversion of 33% over a time span of 18 to 24 hours was used. For oxides of sulfur to sulfate formation, the conversion of 50% over 8 hours was used. These conversion rates can be input into the ISCST3 model to predict possible nitrate and sulfate PM10 impacts. The combined three-project nitrate impact was predicted to be approximately $1\mu\text{g}/\text{m}^3$, located about 50 miles to the northeast of the projects' sites. The combined sulfate impacts would be approximately $0.1\mu\text{g}/\text{m}^3$, located about 30 miles to the northeast. For a more complete discussion of the cumulative modeling analysis, please refer to Appendix A.

VISIBILITY IMPACTS

A visibility analysis of the project's gaseous emissions is required under the Federal Prevention of Significant Deterioration (PSD) permitting program. The analysis addresses the contributions of gaseous emissions (primarily NOx) and particulate (PM10) emissions to visibility impairment on the nearest Class 1 PSD areas, which are national parks and national wildlife refuges. The nearest Class 1 areas to the La Paloma Project are the Domeland Wilderness Area 90 miles to the northeast and the San Rafael Wilderness Area 35 miles to the south. La Paloma used the EPA approved model VISCSCREEN to assess the project's visibility impacts. The results from the VISCSCREEN modeling analysis indicated that the project's visibility impacts would be below the significance criteria for contrast and perception. Therefore the project's visibility impacts on these Class 1 areas are considered insignificant.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

CONSTRUCTION MITIGATION

As discussed earlier in the applicable LORS section, there are a series of District rules under Regulation 8 that limit fugitive dust during the construction phase of a project. Those rules require the use of chemical stabilizing agents and dust suppressants on gravel areas on site, and the wetting or covering of stored earth materials on site. These rules also require that the transporting of borrow fill dirt

material be wetted, be covered, or sufficient freeboard be allowed. They also encourage, although do not require, the use of paved access aprons, gravel strips, wheel washing or other means to limit mud or dirt carry-out onto paved public roads. Because they are required by District rules, La Paloma will employ appropriate fugitive dust mitigation measures to limit their construction related PM10 emissions.

To minimize combustion emissions such as NOx, CO and PM10, which is not required by District rules, La Paloma is proposing to require that contractors properly maintain vehicle/equipment engines to control exhaust emissions.

OPERATIONS MITIGATION

The LPGP's air pollutant emissions impacts will be reduced by using emission control equipment on the project and by providing emission offsets. To reduce NOx emissions, La Paloma proposes to use dry-low NOx combustors in the CTGs. In addition, on at least three of the HRSGs, an ammonia injection grid will be used in conjunction with a Selective Catalytic Reduction system. On the fourth HRSG, La Paloma intends to install either an ammonia injection/SCR system or the SCONOXTM emissions control technology.

To reduce CO and VOC emissions, La Paloma proposes to use a combination of good combustion and maintenance practices, along with an oxidizing catalyst located in the HRSG. PM10 emissions will be limited by the use of a clean burning fuel (natural gas) and the efficient combustion process of the CTGs. The use of natural gas as the only fuel will limit SO2 emissions.

COMBUSTION TURBINE

Dry Low-NOx Combustors

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NOx formed during combustion. Because of the expense and efficiency losses due to steam or water injection in the combustor cans to reduce combustion temperatures and the formation of NOx, CTG manufacturers are presently choosing to limit NOx formation through the use of dry low-NOx technologies. The ABB version of the dry low-NOx combustor is the Sequential Combustion System. Unique to this design is that the fuel/air mixture is ignited twice in two independent annular combustors. The natural gas/air mixture is mixed and combusted in the first combustor can. The hot gases are then directed to a second combustor can, where additional fuel is added and a second combustion process takes place.

In this process, firing temperatures remain somewhat low, thus minimizing NOx formation, while thermal efficiencies remain high. At steady state CTG loads greater than 40 percent load, NOx concentrations entering the HRSG are 25 ppm

corrected to 15 percent O₂. CO concentrations are more variable, with concentrations greater than 100 ppm at 50 percent load, dropping to 5 ppm at 100 percent load.

FLUE GAS CONTROLS

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, flue gas controls, primarily catalyst systems, will be installed in the HRSGs. La Paloma is proposing two catalyst systems, a selective catalytic reduction system to reduce NO_x, and an oxidizing system to reduce CO. A third type of catalyst system, known as SCONOXTM, is also being proposed for installation in one of the four HRSGs, in lieu of the SCR and oxidizing catalyst in that HRSG.

Selective Catalytic Reduction (SCR)

Selective catalytic reduction refers to a process that chemically reduces NO_x by injecting ammonia into the flue gas stream over a catalyst in the presence of oxygen. The process is termed selective because the ammonia reducing agent preferentially reacts with NO_x rather than oxygen, producing inert nitrogen and water vapor. The performance and effectiveness of SCR systems are related to operating temperatures, which may vary with catalyst designs. Flue gas temperatures from a combustion turbine typically range from 950 to 1100°F.

Catalysts generally operate between 600 to 750°F (ARB 1992), and are normally placed inside the HRSG where the flue gas temperature has cooled. At temperatures lower than 600°F, the ammonia reaction rate may start to decline, resulting in increasing ammonia emissions, called ammonia slip. At temperatures above about 800°F, depending on the type of material used in the catalyst, damage to some catalysts can occur. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or a noble metal are also used. These newer catalysts (versus the older alumina-based catalysts) are resistant to fuel sulfur fouling at temperatures below 770°F (EPRI 1990).

Regardless of the type of catalyst used, efficient conversion of NO_x to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream. Also, the catalyst surface has to be large enough to ensure sufficient time for the reaction to take place.

La Paloma proposes to use a combination of the dry low-NO_x combustors and SCR system to produce a NO_x concentration exiting the HRSG stack of 2.5 ppm, corrected to 15 percent excess oxygen averaged over a 1-hour period.

Oxidizing Catalyst

To reduce the turbine carbon monoxide (CO) emissions, La Paloma proposes to install an oxidizing catalyst, which is similar in concept to catalytic converters used

in automobiles. The catalyst is usually coated with a noble metal, such as platinum, which will oxidize unburned hydrocarbons and CO to water vapor and carbon dioxide (CO₂). The CO catalyst is proposed to limit the CO concentrations exiting the HRSG stack to 10 ppm, corrected to 15 percent excess oxygen and averaged over three hours, when the turbine load is less than 73 percent (approximately 221 MW output). At loads above 73 percent, the oxidizing catalyst would limit CO emissions to 6 ppm at 15 percent O₂.

SCONOX™

A new and promising flue gas emissions control technology is the SCONOX™ catalytic absorption system manufactured by Goalline Environmental Technologies. SCONOX™ uses a single precious metal catalyst for the removal of NO_x and CO without the need of a reagent, such as ammonia. The catalyst is installed in the HRSG, much like an SCR system, and operates in a temperature range of 300°F to 700°F. CO is oxidized by the catalyst to CO₂ and is then emitted out of the HRSG stack. NO_x emissions are absorbed onto the catalyst by means of a potassium carbonate coating on the catalyst. A series of mechanically operated dampers then isolates a catalyst block assembly and a dilute hydrogen (less than 4 percent) reducing gas is introduced and the absorbed NO_x is converted to elemental nitrogen. The dampers are then opened, the elemental nitrogen passes out the HRSG stack, and the regenerated catalyst block is used again to absorb NO_x and oxidize CO.

The experience with SCONOX™ at a commercial level is limited to the Sunlaw Federal Cogeneration facility using a GE LM2500 (approximately 34 MW) located in Vernon, in the Los Angeles Basin. This project has been in operation since December 1996 and has routinely operated at NO_x levels of 2 ppm.

ABB Environmental Services, part of the same ABB Company that manufactures the combustion turbine, has agreed to be the licensee of the SCONOX™ technology for power projects greater than 100 MW. Because of ABB's strong financial position, its technical expertise and their reputation as a large, power industry-related company, La Paloma is hoping to install a SCONOX™ system on one of the four HRSGs. However, the availability of SCONOX™ will depend on the commercial availability of the technology from ABB, so its use on the LPGP at this time is still an uncertainty.

COOLING TOWER

Cooling tower drift consists of small water droplets, which contain particulate matter that originate from the total dissolved solids in the circulating water. To limit these particulate emissions, drift eliminators are installed in the cooling tower to capture these water droplets. La Paloma intends to use drift eliminators on the cooling tower, with a design efficiency of 0.0006 percent. This is a very high level of efficiency for cooling tower drift eliminators. Similar cooling tower designs have

been used successfully by a number of other projects licensed by the Energy Commission in recent years.

EMISSION OFFSETS

District Rule 2102, Section 4.2, requires that La Paloma provide emission offsets, in the form of banked Emission Reduction Credits (ERC), for the project's emissions increases of NO_x, SO₂, VOC and PM₁₀. La Paloma has secured a number of offsets through option agreements. Offsets for the project's CO emissions are not required since the project will not cause any violations of any CO standard and the area currently does not experience any violations of any CO standard. A summary of the offset proposal is shown in AIR QUALITY Table 14. This table shows that for NO_x, SO₂ and VOC, that offsets for those pollutants are adequately provided. However, for PM₁₀, offsets to cover approximately 27 percent of the PM₁₀ liability are secured. The balance of that liability comes from the interpollutant trade of NO_x for PM₁₀. The ratio of 2.22 pounds of NO_x for every one pound of PM₁₀ was determined by the District as the appropriate interpollutant trading ratio. The District rules allow for such inter-pollutant trading (Rule 4.2.5.3). Staff agrees that based on the relationship of NO_x contributing to secondary PM₁₀ formation of ammonium nitrate, especially during the high ambient PM₁₀ winter season, that NO_x reductions for PM₁₀ increases is an appropriate mitigation measure. For a more complete discussion of how the LPGP's emission offset proposal satisfies the District's offset rule requirements, please refer to the District's DOC (SJVUAPCD 1999b).

**AIR QUALITY Table 14
Emissions Offsets Balance**

	Offsets Required	Offsets provided (adjusted for distance)	Balance	Additional needed for NO _x :PM trade	NO _x offsets provided for PM ₁₀	Final Balance	Average daily emission Offsets provided	Average daily project emissions
	Tons/year						Lb./day	
PM ₁₀	284.41	76.79	207.71	502.64 ^a	555.00 ^a	-52.36 ^a	562	1558
NO _x	278.19	358.94 ^b	-80.75	--	--	--	5633	1561
SO ₂	59.92	60.00	-0.08	--	--	--	395	334
VOC	39.73	50.00	-10.27	--	--	--	329	249
^a figures shown are NO _x to fully offset PM ₁₀ liability								
^b includes remainder from PM ₁₀ offset (-52.36 tons)								

As Table 14 shows, the project is fully offset, per the District's rule requirements on an annual basis. However, staff also compared the LPGP's likely daily emissions to the emissions offsets to determine whether the project's short term (daily) emissions are mitigated with the offset package. The last two columns of Table 14 compare the likely daily emissions from LPGP to the average daily emission reductions that are being

used to offset the project. For NO_x, SO₂ and VOC, there is a net emissions reduction on a daily basis. In the case for NO_x, the emissions reductions provided are approximately three and one-half times the LPGP's likely NO_x emissions. For PM₁₀, there would be a net emissions increase of approximately 1000 pounds per day. However, those excess NO_x reductions, applied at a ratio of 2.2 to 1, more than adequately balances that PM₁₀ emission increase from LPGP. Therefore, on a daily basis, the LPGP's emissions are sufficiently mitigated to avoid a significant air quality impact.

The San Joaquin Valley Unified Air Pollution Control District is one of the largest air districts in the state, stretching from San Joaquin County to the north to Kern County to the south. The District's offsetting rules allow (as discussed under applicable LORS) that offsets may be used from anywhere within the District. In the case of LPGP, offsets come from as close as the McKittrick area to as far away as Stockton. The only distinction between these credits is that offsets secured in the local area such as McKittrick would be discounted by a distance ratio of 1.2:1 (less than 15 miles from LPGP), while sources further away (greater than 15 miles) would be discounted by 1.5:1.

There are four sources of emission offsets for the LPGP. The majority of the offsets are from credits previously held by Aera Energy LLC located in western Kern County. Aera banked these credits from the shutdown of numerous steam generators used in thermal enhanced oil recovery, the conversion of crude oil fired steam generators to natural gas fired, the retro-fit of a number of gas-fired steam generators with low-NO_x burners, and the conversion of heavy oil test stations to pressurized tanks to limit VOC emissions. These sources of emissions are all within 15 miles of the LPGP and account for approximately 54 percent of the NO_x provided, 49 percent of the PM₁₀ credits, and all of the SO₂ and VOC credits.

Another source of credits is from the San Joaquin Valley Energy Partners' shutdown of a wood-waste fired boiler located in Fresno County. Credits acquired from this source are relatively small, accounting for only about four percent of the PM₁₀ credits, and less than one percent of the NO_x credits.

A third source of credits is from GWF Power Systems, who in turn had purchased credits from Spreckels Sugar Company. Spreckels owns two sugar beet refineries, one in Manteca in San Joaquin County and a second in Mendota in Fresno County. At both of these plants, Spreckels had retro-fitted low NO_x burners to existing boilers that result in the granting of ERC to Spreckels in 1993. The Spreckels Sugar NO_x credits amount to approximately 21 percent of the NO_x credits being provided for LPGP.

The final source of ERC is from the Newark Sierra Paperboard Corporation located in Stockton. Newark Sierra retrofitted two boilers with low-NO_x burners and reduced the amount of fuel oil burned and applied for ERC in 1991. The ERC that La Paloma

acquired for Newark Sierra amount to approximately 24 percent of the NOx credits and 47 percent of the PM10 credits.

ADEQUACY OF PROPOSED MITIGATION

CONSTRUCTION MITIGATION

La Paloma is required to comply with the District Regulation 8 for limiting fugitive dust emissions during construction. In addition, they will require that all large diesel construction equipment used by contractors be in proper operating condition and their engines appropriately tuned. Staff believes that additional measures are necessary to mitigate potential construction impacts (refer to staff proposed mitigation below).

OPERATIONS MITIGATION

EMISSION CONTROLS

La Paloma has proposed, in their opinion, all practical and technically feasible mitigation measures to limit NOx emissions from the GT-24 combustion turbines to 2.5 ppm over a 1-hour average. In addition, they propose to use an oxidizing catalyst to limit CO emissions to 6 ppm at loads above 73 percent load, which will also limit VOC emissions to 0.4 ppm. These levels of control are defined as Best Available Control Technology by the District and are consistent with USEPA recommendations for BACT.

La Paloma's use of drift eliminators with an efficiency of 0.0006 percent represent the state-of-the-art of drift eliminator design. To our knowledge, commercially available drift eliminators with even higher efficiency, which could further reduce the cooling tower's PM10 emissions, are not available.

OFFSETS

The District has found that La Paloma has proposed a complete offset package that is in compliance with their New Source Review rule. Staff is satisfied that all the ERC sources have been identified, and that the offsets are under contractual agreements with La Paloma. In addition, the quantity of emission offsets adequately mitigates any potential short-term impacts (on a daily basis) that the LPGP could possibly contribute.

It should be noted that EPA has some concerns about the NOx and PM10 credits that are expressed in correspondence in March 1998 with a rebuttal by the District in November. EPA also commented on the use of these credits for the LPGP in their comment letter to the District on the PDOC (USEPA 1999). The District responded (SJVUAPCD 1999c) to this letter by saying that they (the District) still believe that the ERC are surplus and appropriate. However, in response to EPA's

concerns, the District and EPA have agreed that the District will provide a detailed tracking system that demonstrates that the District's emissions trading program provides more emission reductions than are required by the federal New Source Review program. According to the District, this tracking program and any remedial actions that may result from any emissions reduction shortfall will not affect previously approved projects, such as LPGP.

STAFF PROPOSED MITIGATION

CONSTRUCTION MITIGATION

As stated above, there are a number of rules in the District's Regulation 8 that will minimize fugitive dust emissions. Those rules allow for some latitude and flexibility as to how they will demonstrate compliance. La Paloma is obligated to meet the requirements of these rules, and staff believes that they should demonstrate specifically how they intend to meet the requirements of these rules and minimize fugitive dust emissions during construction. Staff proposes that prior to the commencement of construction, that La Paloma provide a fugitive dust maintenance plan that specifically spells out the mitigation measures that La Paloma will employ to limit fugitive dust during construction and comply with District Regulation 8.

The modeling assessment discussed earlier shows that the combustion sources used for heavy construction have the potential for causing significant air quality impacts. The most feasible mitigation measure to limit these emissions is to have well maintained and properly tuned internal combustion engines. La Paloma has proposed that they will require contractors to maintain their vehicles and equipment to limit exhaust emissions. To enforce this, staff proposes that La Paloma require that the contractors maintain records of proper engine maintenance and tune-ups for the major combustion equipment, such as the bulldozers, backhoes, compactors, loaders, motor graders, trenchers, cranes, dump trucks and other heavy duty construction related trucks; and have the appropriate maintenance records available on-site for inspection. Staff proposes that as a part of a contractor's bid, that the contractor provide records that his equipment has been properly maintained according to the engine manufacturers' specifications.

OPERATIONS MITIGATION

Staff does not propose any additional mitigation measures.

COMPLIANCE WITH LORS

FEDERAL

On May 18, 1999, the USEPA issued a preliminary Prevention of Significant Deterioration (PSD) permit subject to a 30 day public comment period. If after that

public comment period and there is no substantive new information is filed, then USEPA intends to file an Approval for Construct for the project subject to the proposed permit conditions.

STATE

With the District's issuance of a Determination of Compliance and the CEC staff's affirmative finding for the project, La Paloma has demonstrated that the LPGP complies with Section 41700 of the California State Health and Safety Code.

LOCAL

Compliance with specific SJVUAPCD rules and regulations are discussed below. For a more detailed discussion of the compliance of the LPGP, please refer to the Determination of Compliance (SJVUAPCD 1999a).

RULE 2201 - NEW AND MODIFIED STATIONARY SOURCE REVIEW RULE

SECTION 4.1 - BEST AVAILABLE CONTROL TECHNOLOGY

The SJVUAPCD has determined the Best Available Control Technology for the emission generating equipment and is summarized in the following AIR QUALITY Table 15.

**AIR QUALITY Table 15
BACT Determinations**

Pollutant	Gas Turbine Engines	Cooling Towers	Internal Combustion Engines
PM10	Air inlet filters, lube oil vent coalescer and opacity <5%, natural gas fuel	Drift eliminators with efficiency of 0.0006%	Low sulfur ($\leq 0.05\%$ by weight) diesel fuel
SO2	Utility quality natural gas	--	Low sulfur ($\leq 0.05\%$ by weight) diesel fuel
NOx	2.5 ppm @ 15% O2, 1-hr average	--	Certified emission rate of 7.2 g/hp hr
VOC	0.4 ppm @ 15% O2	--	Positive crankcase ventilation
CO	6 ppm @ 15% O2, at loads above 73% 10 ppm @ 15% O2, at loads below 73% 3-hr average	--	No additional controls

SECTION 4.2 - OFFSETS

According to this rule, emission offsets for the five emergency IC engines are not required. Each IC engine is allowed to operate up to 200 hours per year without providing offsets for those engines' emissions. In addition, La Paloma demonstrated through air dispersion modeling that their project would not cause a violation of any CO ambient air quality standard, therefore CO emission offsets are not required for the combustion turbine CO emissions. All other project emissions

are subject to emissions offsets, which are discussed in the Mitigation section of this analysis, and in greater detail in the DOC.

SECTION 4.3 - ADDITIONAL SOURCE REQUIREMENTS

Rule 4.3.2.1 requires that a new source not cause, or make worse, the violation of an ambient air quality standard as demonstrated through analysis with air dispersion models. Because the project demonstrates that it does not cause a violation of any CO ambient air quality standard, and that the project is fully offset for its other emissions, the District has determined that the LPGP will not make the ambient air quality worse.

Rule 2520 – Federally Mandated Operating Permits

La Paloma is required to file a Title V Operating permit with the District within 12 months of commencing operation. Presently, no action is required.

Rule 2540 – Acid Rain Program

An acid rain application must be submitted at least 24 months prior to the project generating electricity. Based on La Paloma's schedule, they will have to submit an application during the third quarter of 1999. The requirements will include that NO_x and SO_x emissions will have to be monitored and a small quantity of SO_x allowance will have to be provided from a national SO_x allowance bank. Compliance will be determined at a later date.

Rule 4001 - New Source Performance Standards

Based on the heat rate of the ABB GT-24 turbine, a NSPS NO_x limit is calculated at 116 ppmv at 15% O₂. The LPGP will be permitted at 2.5 ppmv at 15% O₂. The SO_x emission concentration will be 0.23 ppmv at 15% O₂ which is less than the NSPS requirement of 150 ppmv. The sulfur content of the natural gas fuel is equivalent to 0.004% which is less than the NSPS requirement of 0.8%. Compliance with Rule 4001 is therefore demonstrated.

Rule 4101 - Visible Emissions

All equipment will be limited to a 5 percent opacity limit by permit condition, which is less than the rule requirement of 20 percent opacity.

Rule 4201 - Particulate Matter Concentration

The District determined that the particulate emissions from the various emissions generating equipment are the following:

ABB GTEs:	0.001 gr/dscf,
Cooling Towers:	6.8×10^{-5} gr/dscf
IC engine/firewater pump:	0.02 gr/dscf
IC engine/generator:	0.05 gr/dscf

All of these emission rates are below the rule limit of 0.1 gr/dscf, therefore compliance is demonstrated.

Rule 4202 – Particulate Matter Emission Rate

Since the combustion equipment from the LPGP is exempt from this rule, only the emissions of particulate from the cooling towers are limited by this rule. The Rule 4202 emission rate for each cooling tower is 88 lb/hr. The projected particulate emissions from each cooling tower is 0.47 lb/hr, therefore compliance is demonstrated.

Rule 4703 - Stationary Gas Turbines

The permitted NO_x limit of 2.5 ppm is below the rule mandated limits of 12.2 ppm for SCR controlled turbines and 21 ppm for SCONO_x controlled turbines. The permitted CO limit of 10 ppm is well below the rule requirement of 200 ppm.

Rule 4801 - SO₂ Concentration

The SO₂ concentrations of 0.23 ppm for the turbines, 60 ppmvd for the IC engine/firewater pump and 70 ppmvd for the IC engine/electrical generator are all well below the rule limit of 2,000 ppmvd.

Rule 8010 - Fugitive Dust Administrative Requirements for Control of Fine Particulate Matter (PM-10)

La Paloma will provide a Construction Fugitive Dust Mitigation Plan that will discuss the types of chemical stabilizing agents and dust suppressant materials they intend to use.

Rule 8020 - Fugitive Dust Requirements for Control of Fine Particulate Matter (PM-10) from Construction, Demolition, Excavation, and Extraction Activities

The Construction Fugitive Dust Mitigation Plan will specify the specific measures that La Paloma will employ to limit fugitive dust and thus comply with this rule.

Rule 8030 - Control of PM₁₀ from Handling and Storage of Bulk Materials

The Construction Fugitive Dust Mitigation Plan will specify the specific measures that La Paloma will employ to limit fugitive dust during the handling and transport of the borrow soil and thus comply with this rule.

Rule 8060 - Control of PM₁₀ from Paved and Unpaved Roads

The Construction Fugitive Dust Mitigation Plan will specify the use of chemical dust suppressant and/or the use of paved shoulders on paved roadways that will demonstrate compliance with this rule.

Rule 8070 - Control of PM₁₀ from Vehicle/Equipment Parking, Shipping, Receiving, Transfer, Fueling and Service Areas

The Construction Fugitive Dust Mitigation Plan will include measures to limit fugitive dust from unpaved parking areas and the tracking out of mud and dirt onto public roadways, and thus demonstrate compliance with this rule.

CONCLUSIONS AND RECOMMENDATIONS

The La Paloma project's emissions of NO_x, SO₂ and CO will not cause a violation of any NO₂, SO₂ or CO ambient air quality standard, and therefore their impacts are not significant. The project's air quality impacts from directly emitted PM₁₀ and of the ozone precursor emissions of NO_x and VOC and PM₁₀ precursors of NO_x and SO₂ could be significant if left unmitigated. La Paloma will reduce emissions to the extent feasible and provide emission offsets for their NO_x, VOC, SO₂ and PM₁₀ emissions, and thus these mitigation measures reduce the potential for directly emitted PM₁₀ and ozone and secondary PM₁₀ formation to a level of insignificance.

The District has submitted a Final Determination of Compliance that concludes that the La Paloma project would comply with all applicable District rules and regulations and therefore has proposed a set of proposed conditions, which are presented here as Conditions AQ-1 through AQ-61.

CEC staff recommends the inclusion of two conditions (AQ-C1 and AQ-C2) that addresses construction related impacts. Staff therefore recommends certification of the La Paloma Generating Project with the following Proposed Conditions of Certification.

CONDITIONS OF CERTIFICATION

AQ-C1 Prior to the commencement of project construction, the project owner shall prepare a Construction Fugitive Dust Mitigation Plan that will specifically identify fugitive dust mitigation measures that will be employed for the construction of the La Paloma project and related facilities.

a) The Construction Fugitive Dust Mitigation Plan shall specifically identify measures to limit fugitive dust emissions from construction of the project site, the raw water pipeline, pump station and tank sites. Measures that should be addressed include the following:

- the identification of the employee parking area(s) and surface of the parking area(s);
- the frequency of watering of unpaved roads and disturbed areas;
- the application of chemical dust suppressants;
- the stabilization of storage piles and disturbed areas;
- the use of gravel in high traffic areas;
- the use of paved access aprons;
- the use of posted speed limit signs;
- the use of wheel washing areas prior to large trucks leaving the project site; and,
- the methods that will be used to clean tracked-out mud and dirt from the project site onto public roads.

b) The following measures should be addressed for the transportation of the borrow fill material to the La Paloma project site and the raw water

pumping station: the use of covers on the vehicles, the wetting of the material and insuring appropriate freeboard of material in the vehicles.

Verification: At least sixty (60) days prior to the start of construction, the project owner shall provide the CPM with a copy of the Construction Fugitive Dust Mitigation Plan for approval.

AQ-C2 The project owner shall ensure that all heavy earthmoving equipment, that includes bulldozers, backhoes, compactors, loaders, motor graders and trenchers, and cranes, dump trucks and other heavy duty construction related trucks, have been properly maintained and the engines tuned to the engine manufacturer's specifications.

Verification: The project owner shall submit to the CPM, via the Monthly Compliance Report, documentation, which demonstrates that the contractor's heavy earthmoving equipment is properly maintained and the engines are tuned to the manufacturer's specifications. The project owner shall maintain all records on the site for six months following the start of commercial operation.

Conditions of Certification AQ-1 through AQ-36 apply to the following equipment:

SJVUAPCD Permit No. S-3412-1-0 - ABB GT-24 NATURAL GAS FIRED COMBINED CYCLE GAS TURBINE ENGINE/ELECTRICAL GENERATOR #1 WITH DRY LOW NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION, OXIDIATION CATALYST, AND STEAM TURBINE (262 MW TOTAL NOMINAL RATING),

SJVUAPCD Permit No. S-3412-2-0 - ABB GT-24 NATURAL GAS FIRED COMBINED CYCLE GAS TURBINE ENGINE/ELECTRICAL GENERATOR #2 WITH DRY LOW NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION, OXIDIATION CATALYST, AND STEAM TURBINE (262 MW TOTAL NOMINAL RATING),

SJVUAPCD Permit No. S-3412-3-0 - ABB GT-24 NATURAL GAS FIRED COMBINED CYCLE GAS TURBINE ENGINE/ELECTRICAL GENERATOR #3 WITH DRY LOW NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION, OXIDATION CATALYST, AND STEAM TURBINE (262 MW TOTAL NOMINAL RATING), and

SJVUAPCD Permit No. S-3412-4-0 - ABB GT-24 NATURAL GAS FIRED COMBINED CYCLE GAS TURBINE ENGINE/ELECTRICAL GENERATOR #4 WITH DRY LOW NOX COMBUSTORS, STEAM TURBINE, AND SCONOX SYSTEM OR SELECTIVE CATALYTIC REDUCTION AND OXIDATION CATALYST (262 MW TOTAL NOMINAL RATING).

AQ-1 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-2 The project owner shall submit SCONOX (in the case of permit number S-3412-4-0 only) or selective catalytic reduction, oxidation catalyst, and continuous emission monitor design details to the District at least 30 days prior to commencement of construction. [District Rule 2201]

Verification: The project owner shall provide copies of the as-built drawings of the catalyst system chosen and the continuous emission monitor design detail to the CPM and the District at least 30 days prior to commencement of construction.

AQ-3 Gas turbine engine and generator lube oil vents shall be equipped with mist eliminators. Visible emissions from lube oil vents shall not exceed 5% opacity, except for three minutes in any hour. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-4 The gas turbine engine shall be equipped with continuously recording fuel gas flowmeter. [District Rule 2201]

Verification: The information above shall be included in the quarterly reports of Condition AQ-28.

AQ-5 Gas turbine engine exhaust shall be equipped with continuously recording emissions monitor for NO_x (before and after the SCR unit, if installed), CO, and O₂ dedicated to each permit unit. Continuous emission monitors shall meet the requirements of 40 CFR parts 60 and 75 and shall be capable of monitoring emissions during startups and shutdowns as well as normal operating conditions. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-6 Exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods. [District Rule 1081]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-7 Gas turbine engine shall be fired exclusively on natural gas, consisting primarily of methane and ethane, with a sulfur content no greater than 0.75 grains of sulfur compounds (as S) per 100 dry standard cubic feet of natural gas. [District Rule 2201]

Verification: Please refer to Condition **AQ-27**.

AQ-8 Startup is defined as the period beginning with turbine initial firing until the unit meets the lb/hr and ppmv emission limits in Condition AQ-12. Shutdown is defined as the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Startup and shutdown durations shall not exceed three hours and one hour, respectively, per occurrence. [District Rule 2201 and 4001]

Verification: Please refer to Condition **AQ-28**.

Verification: **AQ-9** Ammonia shall be injected when the selective catalytic reduction temperature exceeds 500 degrees Fahrenheit. The project owner shall monitor and record catalyst temperature during periods of startup. [District Rule 2201]

Verification: The project owner shall record the SCR temperatures and the commencement of ammonia injection times in the daily logs required under Condition AQ-28.

AQ-10 During startup of any gas turbine engine(s), combined emissions from the four gas turbine engines (S-3412-1', '2, '3, and '4) heat recovery steam generator exhausts shall not exceed NOx (as NO₂): 160 lbs, and CO: 2500 lbs in any one hour. [CEQA]

Verification: The project owner shall provide records of the emissions as part of the quarterly reports of Condition AQ-28.

AQ-11 Within two hours of any startup, gas turbine engine heat recovery steam generator exhaust emissions shall not exceed the following: NOx (as NO₂): 12.2 ppmv @ 15% O₂, and CO: 200 ppmv @ 15% O₂. [District Rule 2201]

Verification: The project owner shall provide records of the emissions as part of the quarterly reports of Condition AQ-28.

AQ-12 Emission rates from each gas turbine engine heat recovery steam generator exhaust except during startup and/or shutdown, shall not exceed the following:

PM₁₀: 17.20 lb/hr

SO_x (as SO₂): 3.73 lb/hr

NO_x (as NO₂): 17.30 lb/hr and 2.5 ppmvd @ 15% O₂

VOC: 2.66 lb/hr and 0.4 ppmvd @ 15% O₂

CO: 21.08 lb/hr and either 10 ppmvd @ 15% O₂ at operating loads less than or equal to 221 MW (gross three hour average), or 6 ppmvd @ 15% O₂ at operating loads greater than 221 MW (gross three hour average)

ammonia: 10 ppmvd @ 15% O₂ (except for the SCONO_x equipped unit).

NO_x (as NO₂) emission limit is a one hour rolling average. Ammonia emission limit is a twenty four hour rolling average. All other emission limits are three hour rolling averages. [District Rules 2201, 4001, and 4703]

Verification: The project owner shall provide records of the emissions as part of the quarterly reports of Condition AQ-28.

AQ-13 Emission rates from each gas turbine engine heat recovery steam generator exhaust, on days when a startup or shutdown occurs, shall not exceed the following:

PM10: 412.8 lb/day
Sox (as SO₂): 89.5 lb/day
NO_x (as NO₂): 511.4 lb/day
VOC: 139.8 lb/day
CO: 1,873.0 lb/day
[District Rule 2201]

Verification: The project owner shall provide records of the emissions as part of the quarterly reports of Condition AQ-28.

AQ-14 Twelve month rolling average emissions from each gas turbine engine heat recovery steam generator exhaust shall not exceed the following:

PM10: 140,160 lb/year
SO_x (as SO₂): 29,959 lb/year
NO_x (as NO₂): 144,093 lb/year
VOC: 24,865 lb/year
CO: 209,029 lb/year
[District Rule 2201]

Verification: The project owner shall provide records of the emissions as part of the quarterly reports of Condition AQ-28.

AQ-15 Upon implementation of S-3412-1-0 through '6-0, emission offsets certificates shall be provided for all calendar quarters in the following amounts, at the offset ratio specified in Rule 2201 (6/15/95 version) Table 1:

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
PM10	140,256 lb	141,814 lb	143,373 lb	143,373 lb
SO _x (as SO ₂)	29,549 lb	29,877 lb	30,205 lb	30,205 lb
NO _x (as NO ₂)	137,188 lb	138,712 lb	140,236 lb	140,236 lb
VOC	19,593 lb	19,811 lb	20,028 lb	20,028 lb

[District Rule 2201]

Verification: The project owner shall provide copies of all the necessary ERC certificates to the CPM no later than 30 days prior to the commencement of construction.

AQ-16 NOx and VOC emission reductions that occurred from April through November may be used to offset increases in NOx and VOC during any period of the year. [District Rule 2201]

Verification: The project owner shall provide copies of all the necessary ERC certificates to the CPM no later than 30 days prior to the commencement of construction.

AQ-17 NOx ERCs may be used to offset PM10 emission increases at a ratio of 2.22 lb NOx : 1 lb PM10. [District Rule 2201]

Verification: The project owner shall provide copies of all the necessary ERC certificates to the CPM no later than 30 days prior to the commencement of construction.

AQ-18 At least 30 days prior to commencement of construction, the project owner shall provide the District, with written documentation that all necessary offsets have been acquired or that binding contracts to secure such offsets have been entered into. [District Rule 2201]

Verification: The project owner shall provide copies of all the necessary ERC certificates to the CPM no later than 30 days prior to the commencement of construction.

AQ-19 Compliance with the short term emission limits (lb/hr and ppmv @ 15% O2) shall be demonstrated within 90 days of initial operation of each gas turbine engine and annually thereafter by District witnessed in situ sampling of exhaust gasses by a qualified independent source test firm at full load conditions as follows:

NOx:	ppmvd @ 15% O2 and lb/hr,
CO:	ppmvd @ 15% O2 and lb/hr,
VOC:	ppmvd @ 15% O2 and lb/hr,
PM10:	lb/hr, and
ammonia:	ppmvd @ 15% O2 (except for the SCONOX equipped unit)

Sample collection to demonstrate compliance with the ammonia emission limit shall be based on a two hour or longer average. [District Rule 1081]

Verification: Please refer to the information requirements of Condition AQ-22.

AQ-20 Compliance with the cold start NO_x and CO mass emission limits shall be demonstrated for one of the gas turbines engines (S-3412-1, '2, '3, or '4) upon initial operation and at least every seven years thereafter by District witnessed in situ sampling of exhaust gasses by a qualified independent source test firm. [District Rule 1081]

Verification: Please refer to the information requirements of Condition AQ-22.

AQ-21 Compliance with natural gas sulfur content limit shall be demonstrated within 90 days of operation of each gas turbine engine and periodically as required by 40 CFR 60 Subpart GG and 40 CFR 75. [District Rules 1081, 2540, and 4001]

Verification: Please refer to the information requirements of Condition AQ-27.

AQ-22 The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. Official test results and field data collected by source tests required by conditions on this permit shall be submitted to the District within 60 days of testing. [District Rule 1081]

Verification: The project owner shall notify the CPM and the District 30 days prior to any compliance source test. The Project owner shall provide a source test plan to the CPM and District for the CPM and District approval 15 days prior to testing. The results and field data collected by the source tests shall be submitted to the CPM and the District within 60 days of testing.

AQ-23 The source test plans for the initial and seven-year source test shall include a method for measuring the CO/VOC surrogate relationship that will be used to demonstrate compliance with VOC lb/hr, lb/day, and lb/twelve month rolling average emission limits. [District Rule 2201]

Verification: The Project owner shall provide a source test plan to the CPM and District for the CPM and District approval 15 days prior to testing.

AQ-24 The following test methods shall be used:

PM ₁₀ :	EPA method 5 (front half and back half),
NO _x :	EPA method 7E or 20
CO:	EPA method 10 or 10B
O ₂ :	EPA method 3, 3A, or 20

VOC: EPA method 18
ammonia: BAAQMD ST-1B, (except for the SCONOx equipped unit)
fuel gas sulfur content: ASTM D3246.

Alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081, 4001, and 4703]

Verification: As part of the test plan to be submitted under Condition AQ-22, the project owner shall identify the test methods to be used in the annual compliance source testing.

AQ-25 The project owner shall notify the District of a), the date of initiation of construction no later than 30 days after such date, b) the date of anticipated startup not more than 60 days nor less than 30 days prior to such date, and c), the date of actual startup within 15 days after such date. [District Rule 4001]

Verification: The project owner shall notify the CPM and the District of the date of initiation of construction no later than 30 days after such date. The project owner shall notify the CPM and the District of the date of anticipated startup not more than 60 days nor less than 30 days prior to such date, and the date of actual startup within 15 days after such date.

AQ-26 The project owner shall maintain hourly records of NOx, CO and ammonia (except for the SCONOx equipped unit) emission concentrations (ppmv @ 15% O2), and hourly, daily and twelve month rolling average records of NOx and CO emissions. Ongoing compliance with the CO emission limits during normal operation shall be deemed compliance with the VOC emission limits during normal operation. [District Rule 2201]

Verification: The project owner shall compile the required data and submit the quarterly reports to the CPM within 30 days of the end of the quarter.

AQ-27 The project owner shall maintain records of SOx lb/hr, lb/day, and lb/twelve month rolling average emissions. SOx emissions shall be based on fuel use records, natural gas sulfur content, and mass balance calculations. [District Rule 2201]

Verification: The project owner shall provide records of the information described above as part of the quarterly reports of Condition AQ-28.

AQ-28 The project owner shall maintain the following records: occurrence, duration, and type of any startup, shutdown, or malfunction; performance testing, evaluations, calibrations, checks, adjustments, any period during which a continuous monitoring system or monitoring device was inoperative, maintenance of any continuous emission monitor; emission measurements, total daily and rolling twelve month average hours of operation, hourly quantity of fuel used, and gross three hour average operating load. [District Rules 2201 and 4703]

Verification: The project owner shall compile required data and submit the information to the CPM in quarterly reports submitted no later than 60 days after the end of each calendar quarter.

AQ-29 All records required to be maintained by this permit shall be maintained for a period of five years and shall be made readily available for District inspection upon request. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-30 Results of continuous emissions monitoring shall be reduced according to the procedure established in 40 CFR, Part 51, Appendix P, paragraphs 5.0 through 5.3.3, or by other methods deemed equivalent by mutual agreement with the District, the ARB, and the EPA. [District Rule 1080]

Verification: The project owner shall compile the required data in the formats discussed above and submit the results to the CPM quarterly.

AQ-31 The project owner shall notify the District of any breakdown condition as soon as reasonably possible, but no later than one hour after its detection, unless the owner or operator demonstrates to the Districts satisfaction that the longer reporting period was necessary. [District Rule 1100]

Verification: The project owner shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM as part of the quarterly reports of Condition AQ-28.

AQ-32 The District shall be notified in writing within ten days following the correction of any breakdown condition. The breakdown notification shall include a description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those

allowed, and the methods utilized to restore normal operations. [District Rule 1100]

Verification: The project owner shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM as part of the quarterly reports of Condition AQ-28.

AQ-33 Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and total accuracy testing is performed, in accordance with EPA guidelines. The District shall be notified prior to completion of the audits. Audit reports shall be submitted along with quarterly compliance reports to the District. [District Rule 1080]

Verification: The project owner shall submit the continuous emission monitor audit results with the quarterly reports required of Condition AQ-35.

AQ-34 The project owner shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F. [District Rule 1080]

Verification: The project owner shall submit the continuous emission monitor results with the quarterly reports of Condition AQ-35.

AQ-35 The project owner shall submit a written report to the APCO for each calendar quarter, within 30 days of the end of the quarter, including: time intervals, data and magnitude of excess emissions, nature and cause of excess (if known), corrective actions taken and preventive measures adopted; averaging period used for data reporting corresponding to the averaging period specified in the emission test period used to determine compliance with an emission standard; applicable time and date of each period during which the CEM was inoperative (except for zero and span checks) and the nature of system repairs and adjustments; and a negative declaration when no excess emissions occurred. [District Rule 1080]

Verification: The project owner shall compile the required data and submit the quarterly reports to the CPM and the APCO within 30 days of the end of the quarter.

AQ-36 The project owner shall submit an application to the District to comply with Rule 2540 - Acid Rain Program, 24 months before the unit commences operation. [District Rule 2540]

Verification: The project owner shall file their application with the District at least 24 months prior to the commencement of operation of any of the combustion turbine generators.

The following conditions (AQ-37 through AQ-40) shall apply to permit units S-3412-1-0, 2-0, 3-0 and 4-0 for those permit units that use Selective Catalytic Reduction.

AQ-37 The ammonia injection grid shall be equipped with an operational ammonia flowmeter and injection pressure indicator. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB, and the Commission.

AQ-38 The heat recovery steam generator design shall provide space for additional selective catalytic reduction catalyst and oxidation catalyst if required to meet NO_x and CO emission limits. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB, and the Commission.

AQ-39 The project owner shall monitor and record exhaust gas temperature at selective catalytic reduction and oxidation catalyst inlets. [District Rule 2201]

Verification: The project owner shall compile the required temperature data and maintain the data for a period of five years. The project owner shall make the site available for inspection by representatives of the District, CARB, and the Commission.

AQ-40 Compliance with ammonia slip limit shall be demonstrated by using the following calculation procedure: ammonia slip ppmv @ 15% O₂ = $(a - (b \times c / 1,000,000)) \times 1,000,000 / b \times d$, where a = ammonia injection rate (lb/hr) / 17 (lb/lb. mol), b = dry exhaust gas flow rate (lb/hr) / (29 (lb/lb. mol)), c = change in measured NO_x concentration ppmv at 15% O₂ across catalyst, and d = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip. Alternatively, the project owner may utilize a continuous in-stack ammonia monitor, acceptable to the District, to monitor compliance. At least 60 days prior to using a NH₃ CEM, the project owner must submit a monitoring plan for District review and approval. [District Rule 4102]

Verification: Please refer to the requirements of Condition AQ-26. If the project owner chooses to use a NH₃ CEM, the project owner shall submit a monitoring plan to the District for review and approval at least 60 days prior to its use.

The following conditions (AQ-41 through AQ-46) shall apply to permit unit S-3412-4-0 if that permit unit uses the SCONOx system.

AQ-41 The project owner may install either SCONOx or selective catalytic reduction and an oxidation catalyst on this gas turbine engine. If selective catalytic reduction and an oxidation catalyst are installed, this gas turbine engine shall be subject to all the conditions listed in S-3412-1-0 (Conditions AQ-1 through AQ-40), and will not be subject to the conditions listed in S-3412-1-0 (Conditions AQ-42 through AQ-46). [District Rule 2201]

Verification: The project owner shall provide copies of the as-built drawings of the SCONOx catalyst system to the CPM when they become available. The project owner shall make the site available for inspection by representatives of the District, CARB, and the Commission.

AQ-42 If SCONOx is installed, the project owner may replace the SCONOx unit with selective catalytic reduction system and oxidation catalyst within two years after final California Energy Commission certification of the project without receiving a separate approval from the District subject to all the conditions listed in S-3412-1-0 (Conditions AQ-1 through AQ-40). All emission limits in this approval must be satisfied during the replacement of the SCONOx unit. [District Rule 2201]

Verification: The project owner shall notify the CPM in writing if the SCONOX system is replaced by Selective Catalytic Reduction.

AQ-43 SCONOx unit shall be equipped with natural gas and steam injection system for regeneration of SCONOx catalyst. [District Rule 2201]

Verification: The project owner shall provide copies of the as-built drawings of the natural gas and steam injection regeneration SCONOx system to the CPM when they become available. The project owner shall make the site available for inspection by representatives of the District, CARB, and the Commission.

AQ-44 Heat recovery steam generator design shall provide space for installation selective catalytic reduction catalyst and oxidation catalyst. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB, and the Commission.

AQ-45 The project owner shall monitor and record exhaust gas temperature at the SCONOx inlet. [District Rule 2201]

Verification: The project owner shall compile the required temperature data and maintain the data for a period of five years. The project owner shall make the site available for inspection by representatives of the District, CARB, and the Commission.

AQ-46 Within two hours of any startup, gas turbine engine heat recovery steam generator exhaust emissions shall not exceed the following NO_x (as NO₂): 21.0 ppmv @ 15% O₂ and CO: 200 ppmv @ 15% O₂. [District Rule 4703]

Verification: The project owner shall provide the emissions information above to the CPM as part of the quarterly reports of Condition AQ-28.

The following conditions (Conditions AQ-47 through AQ-53) shall apply to permit units S-3412-5-0 and S-3412-6-0:

COOLING TOWER WITH 10 CELLS AND HIGH EFFICIENCY DRIFT ELIMINATOR

AQ-47 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-48 The project owner shall submit drift eliminator design details and vendor specific emission justification for the correction factor to be used to correlate blowdown TDS to drift TDS and the amount of drift that stays suspended in the atmosphere in the equation in Condition AQ-52 to the District at least 30 days prior to commencement of construction. [District Rule 2201]

Verification: 30 days prior to commencement of construction of the cooling towers, the project owner shall submit the information required above to the District and the CPM.

AQ-49 No hexavalent chromium containing compounds shall be added to cooling tower circulating water. [District Rule 7012]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-50 Drift eliminator drift rate shall not exceed 0.0006%. [District Rule 2201]

Verification: The project owner shall submit documentation from the selected cooling tower vendor that verifies the drift efficiency to the CPM 30 days prior to commencement of construction of the cooling towers.

AQ-51 PM10 emission rate for each cooling tower shall not exceed 11.3 lb/day. [District Rule 2201]

Verification: Please refer to Condition AQ-52.

AQ-52 Compliance with PM10 daily emission limits shall be demonstrated as follows: $\text{PM10 lb/day} = \text{cooling water recirculation rate} * \text{total dissolved solids concentration in the blowdown water} * \text{design drift rate} * \text{correction factor}$. [District Rule 2201]

Verification: The project owner shall compile the required daily PM10 emissions data and maintain the data for a period of five years. The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-53 Compliance with PM10 emission limit shall be determined by cooling water sample analysis within 90 days of initial operation and weekly thereafter. [District Rule 1081]

Verification: The project owner shall compile the required daily PM10 emissions data and maintain the data for a period of five years. The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

The following conditions (Conditions AQ-54 through AQ-61) shall apply to the following permit units:

S-3412-7-0 - 310 HP DETROIT DIESEL - ALLISON DDFP-L6FA DIESEL FIRED IC ENGINE POWERING EMERGENCY FIREWATER PUMP;

S-3412-8-0 - 475 HP CATERPILLAR MODEL 3406C DIESEL FIRED IC ENGINE POWERING EMERGENCY ELECTRICAL GENERATOR #1 USED FOR GAS TURBINE ENGINE LUBE OIL CIRCULATION DURING POWER OUTAGES;

S-3412-9-0 - 475 HP CATERPILLAR MODEL 3406C DIESEL FIRED IC ENGINE POWERING EMERGENCY ELECTRICAL GENERATOR #2 USED FOR GAS TURBINE ENGINE LUBE OIL CIRCULATION DURING POWER OUTAGES;

S-3412-10-0 - 475 HP CATERPILLAR MODEL 3406C DIESEL FIRED IC ENGINE POWERING EMERGENCY ELECTRICAL GENERATOR #3 USED FOR GAS TURBINE ENGINE LUBE OIL CIRCULATION DURING POWER OUTAGES; and

S-3412-9-11 - 475 HP CATERPILLAR MODEL 3406C DIESEL FIRED IC ENGINE POWERING EMERGENCY ELECTRICAL GENERATOR #4 USED FOR GAS TURBINE ENGINE LUBE OIL CIRCULATION DURING POWER OUTAGES.

AQ-54 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-55 The project owner shall submit IC engine design details to the District at least 30 days prior to commencement of operation. [District Rule 2201]

Verification: The project owner shall submit the design details described above to the District and CPM at least 30 days prior to commencement of operation of each IC engine unit.

AQ-56 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-57 The engine shall be equipped with a positive crankcase ventilation (PCV) system or a crankcase emissions control device of at least 90% control efficiency unless UL certification would be voided. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-58 The sulfur content of the diesel fuel used shall not exceed 0.05% by weight. [District Rule 2201]

Verification: Please refer to Condition AQ-61.

AQ-59 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-60 The engine shall be operated only for maintenance, testing, and required regulatory purposes, and during emergency situations. Operation of the engine for maintenance and testing purposes shall not exceed 200 hours per year. [District Rules 2201 and 4701]

Verification: The project owner shall compile records of hours of operation of any of the IC engines and include those records as part of the quarterly reports submitted to the CPM under Condition AQ-28.

AQ-61 The project owner shall maintain records of hours of non-emergency operation and of the sulfur content of the diesel fuel used. Such records shall be made available for District inspection upon request for a period of five years. [District Rules 2201 and 4701]

Verification: The project owner shall compile records of hours of operation of the IC engines and of the diesel fuel purchased that includes the sulfur content, and maintain the data for a period of five years. The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

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APPENDIX A

CUMULATIVE AIR QUALITY IMPACT ANALYSIS

Technical Note

Cumulative Air Quality Impact Analysis

La Paloma Generating Station
Kern County, California

May 12, 1999

Prepared for:

Siting and Environment Division
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

1. INTRODUCTION

The objective of this modeling analysis is to quantify cumulative air quality impacts associated with the operation of La Paloma generating station with two other planned generating stations: Sunrise and Elk Hills. All three generating stations are to be located in Western Kern County, California.

In the present analysis, "cumulative" air quality impact means the sum total of air quality impacts from the three generating stations (GS) plus background concentration. The focus of this study is on the following pollutants:

- Carbon Monoxide (CO)
- Oxides of Nitrogen (NO_x)
- Sulfur Dioxide (SO₂)
- Fine Particulate (PM-10)
- Sulfate (SO₄)

2. CRITERIA FOR SIGNIFICANT IMPACT

In order for the cumulative impacts to be considered significant, two criteria would have to be met:

1. The maximum ground level concentration of any air pollutant emitted by the La Paloma GS would increase as a result of contribution from other existing or proposed sources. For the purposes of this analysis, there are no existing sources near the La Paloma GS and the only proposed emission sources are the Elk Hills and Sunrise generating stations.
2. Cumulative maximum ground level concentration would exceed California or Federal ambient air quality standards.

Cumulative air quality impact is considered insignificant unless both criteria are satisfied.

3. MODELING METHODOLOGY

The basic modeling methodology consisted of the following steps:

1. Run ISCST3 with emissions from La Paloma alone.
2. Re-run ISCST3 with emissions from all three plants. (La Paloma, Sunrise and Elk Hills).
3. If there is an increase in the ground level concentration (GLC) at the point of max as determined in Step 1, assess if the increased concentration is likely to violate applicable ambient air quality standard.
4. If there is no increase in max GLC at the point of max concentration, conclude that emissions from Sunrise and Elk Hills would not contribute to the max GLC associated with operation of La Paloma

3.1 SELECTION OF EMISSIONS/OPERATIONAL SCENARIO

Emissions from the three generating stations vary depending on ambient temperature and whether the plants are operating in 'normal' or 'start-up' modes. For the purposes of this analysis it was assumed that La Paloma and Sunrise were operating normally at an ambient temperature of 65 F; it was assumed that Elk Hills was in a start-up mode. These emissions scenarios were selected in consultation with CEC staff. A summary of emissions and other input data used in the modeling analysis are summarized below. The data were obtained from data files provided by the applicants.

Parameter	Units	La Paloma	Elk Hills	Sunrise
CO	lbs/hr	18.8	37.0	26.8
NOx	lbs/hr	15.7	46.6	15.4
SO2	lbs/hr	0.87	2.1	3.3
PM-10	lbs/hr	7.86	18.	18.
No. of Stacks		4	2	2
Stack Height	meters	30	36.6	30.5
Stack Diameter	meters	5.3	5.49	5.79
Exhaust Temp.	K	362	345.	368.
Exit Velocity	meters/sec	18.5	12.5	13.0
<i>Note: Emissions (lb/hr) are per stack.</i>				

3.2 MODELING OF SOX AND NOX CONVERSION TO PARTICULATE MATTER

For NOx emissions, the results of a recent modeling study by Desert Research Institute (DRI 1999) were used. This study concluded that approximately 33% of the NOx, emissions were converted to particulate matter. The time scale involved in this conversion is between 18 to 24 hours. Using these results, the maximum predicted ground level concentration was adjusted to allow for conversion from oxides of nitrogen (NO and NO₂) to nitrate. An estimate of particulate concentration due to secondary formation of nitrate would equal:

$$\text{Max. Particulate concentration} = \text{Max. NO}_2 \text{ Conc.} \times (100-66)/100$$

This approach yields only an order of magnitude estimate of nitrate concentration. A more refined approach that takes into account detailed atmospheric chemistry and the time variation of various chemical species affecting nitrate formation is beyond the scope of this evaluation.

For oxides of sulfur conversion to sulfate, it was assumed that emissions consisted entirely of SO₂ and that the conversion could be modeled as a first order chemical reaction. Under this assumption, one can model the SO₂ to sulfate conversion using a simple decay coefficient or a half-life for SO₂. The half-life of SO₂ varies between 1 to 4 days (Stern, et al, 1984). For the present analysis, a half-life of 8 hours was assumed. That is, 50% of the SO₂ is converted to sulfate in 8 hours. This half-life can be used in ISCST3 to account for the SO₂ to sulfate conversion.

3.3 CHOICE OF AIR DISPERSION MODEL

EPA's ISCST3 air dispersion model was employed for this analysis. This model is recommended by the EPA's Guidelines of Air Quality Models for use in simple and complex terrain. Version 98356 was used to perform the model runs.

3.4 CHOICE OF METEOROLOGICAL DATA

One year (1993) of hourly meteorological data were used to conduct the analysis. The surface data from McKittrick (Station 99991) were supplemented by upper air data from Bakersfield (99992). These data were taken from the input files provided by the applicant for the La Paloma project.

Since the focus of this study was on the cumulative air quality impacts associated with emissions from all three GS, the use of additional years of meteorological data would not change the results or conclusions reached in this study. In other words, the *relative contributions* of the Elk Hills and Sunrise GS emissions to the maximum GLC associated with the operation of La Paloma would remain the same.

3.5 SELECTION OF MODELING GRID

A 2 kilometer grid (100 meter x 100 meter) was used to determine the location of GLC for each source. A second larger grid was used to enclose all three sources. This grid extended 20 km x 20km and was centered at the La Paloma GS. A rectangular coordinate system was used employing the UTM coordinate system.

RESULTS

The results of the analysis show that there would be minimal cumulative impact associated with operation of all three generating stations. For example, the maximum 1-hour NO₂ concentration due solely to emissions from La Paloma would not increase as a result of all three generating stations operating concurrently. For annual NO₂ concentration, there would be a minor increase. Specifically, the results were as follows:

Pollutant	Averaging Time	La Paloma GS	All 3 Stations
NO ₂	1-hour	25.31	25.31
	Annual	0.300	0.343
PM-10	24-hour	1.10	1.12
	Annual	0.150	0.172
SO ₂	24-hour	0.123	0.124
	Annual	0.0167	0.0202
CO	1-hour	30.45	30.46
	8-hour	7.72	7.72

Overall, the analysis showed that inclusion of emissions from the proposed Sunrise and Elk Hills generating stations leads to a new point of maximum ground level concentration. This is shown in the attached contour plots of concentration for emissions from (a) La Paloma; (2) La Paloma, Elk Hills and Sunrise, and (3) Elk Hills and Sunrise. A comparison of Figures 1 and 2 (1-hour NO₂, La Paloma and All 3 Stations), shows negligible contribution in the vicinity of La Paloma from the other two plants.

Figure 2 shows that a new point of maximum concentration near Elk Hills and Sunrise generating stations. This is due entirely from emissions from these two plants as can be confirmed in Figure 3 (Sunrise and Elk Hills). The same pattern was identified for annual NO₂ concentrations as shown in Figures 4-6.

Particulate impacts associated with the conversion of NO₂/NO to nitrate are estimated to be 1 ug/cubic meter. This is based on 33% conversion of the maximum 24-hour averaged NO₂ concentration associated with operation of La Paloma GS. The latter range between 0 to 0.3 ug/cu/meter on a 24 hour basis. The impact of secondary nitrate formation on the PM-10 concentration is not considered significant.

It was noted in Section 3.2 that the time scale for the conversion of NO₂/NO to nitrate is between 18 to 24 hours. This means that areas that are located 175 to 200 miles to the southeast would be impacted with higher nitrate particulate. This would transport the plume out of Kern County to adjacent counties located to the East or Southeast. This estimate is based on the fact that on an annual basis, the predominant winds in Kern County are from the NE with an average annual speed of 8.9 mph (Ref: California Surface Wind Climatology, CARB, June 1984).

Use of the ISCST3 model with a half-life of 8 hours indicates that the maximum 24-hour ground level concentration of SO₂ would decrease from 2.5 ug/cu meter to 2.4 ug/cu meter. This means that about 4% of the SO₂ (0.1 ug/cu meter) would be converted to sulfate. Since the state standard for sulfate is 25 ug/cu meter, the secondary formation of sulfate is not considered significant.

As with NO₂/NO conversion to nitrate, the SO₂ to sulfate conversion takes place over a period of 1-4 days. On this time-scale the emissions would be transported several hundred miles to the East or Southeast. Therefore the highest concentration of sulfate would not occur near the power plants but several hundred miles to the East or Southeast. For example, in 2 days the plume would travel approximately 400 miles from the source. This would transport the sulfate (and nitrate particulates) out of Kern County and possibly, out of state.

BIOLOGICAL RESOURCES

Revised Testimony of Rick York

INTRODUCTION

This section provides the California Energy Commission staff's analysis of potential impacts to biological resources from the La Paloma Generating Company, LLC, (La Paloma) proposal to construct and operate the La Paloma Generating Project (LPGP). This analysis is directed toward impacts to state and federally listed species, species of special concern, wetlands, and other areas of critical biological concern. This analysis describes the biological resources of the project site and related facilities. It also determines the need for mitigation, the adequacy of mitigation proposed by the applicant and, where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels. It also determines compliance with applicable laws, ordinances, regulations and standards (LORS), and recommends conditions of certification.

This analysis is based, in part, on information provided as of March 16, 1999 from the La Paloma Application for Certification (AFC) (LPGP 1998a, AFC section 5.6), biological assessment (LPGP 1998a, Addendum II), addenda to the AFC (LPGP 1998a, Addendum IV, pages 3-10 to 3-15 and LPGP 1998a, Addendum X, pages 1-10), responses to data requests (LPGP 1998a, data responses numbers 16 and 17), supplements (LPGP 1998a, Addendum IX), status reports (LPGP 1999) workshops, site visits, and discussions with various agency representatives.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL

ENDANGERED SPECIES ACT OF 1973

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

MIGRATORY BIRD TREATY ACT

Title 16, United States Code, sections 703 through 711, prohibits the take of migratory birds.

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code, sections 2050 through 2098, protects California's rare, threatened, and endangered species.

CALIFORNIA CODE OF REGULATIONS

Title 14, California Code of Regulations, sections 670.2 and 670.5, lists animals of California designated as threatened or endangered.

FULLY PROTECTED SPECIES

Fish and Game Code, sections 3511, 4700, 5050, and 5515, prohibits take of plants and animals that are fully protected in California.

SIGNIFICANT NATURAL AREAS

Fish and Game Code, section 1930, designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

STREAMBED ALTERATION AGREEMENT

Fish and Game Code, section 1600, reviews project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions and other disturbances.

NATIVE PLANT PROTECTION ACT OF 1977

Fish and Game Code, section 1900 et seq., designates state rare, threatened, and endangered plants.

LOCAL

KERN COUNTY GENERAL PLAN LAND USE, OPEN SPACE, AND CONSERVATION ELEMENTS OF 1994

SECTION 8, RESOURCES

- Policy 14: Habitats of threatened and endangered species should be protected to the greatest extent possible.

KERN COUNTY GENERAL PLAN ENERGY ELEMENT OF 1990

PART 1 - ISSUES, GOALS, POLICIES, AND IMPLEMENTATION

- Policy 12: The County should work closely with local, state, and federal agencies to assure that all projects (both discretionary and ministerial) avoid or minimize direct impacts to fish, wildlife and botanical resources, whenever practical.
- Policy 13: The County should develop and implement measures which result in long-term compensation for wildlife habitat which is unavoidably damaged by energy exploration and development activities.

SETTING

REGIONAL DESCRIPTION

The proposed project site is located in the McKittrick Valley, in the southwestern portion of Kern County. The power plant is to be located 1.9-miles southeast of the community of McKittrick, and about 40-miles west of Bakersfield, California. The proposed power plant site is characterized by a combination of non-native grassland and saltbush scrub. Currently, the McKittrick area is characterized by a combination of oil field development, rural residential, and disturbed/undisturbed native habitats.

Vegetation types found in the project vicinity include alkali sink, non-native grasslands, ruderal, valley saltbush scrub, and perennial and seasonal wetlands. In western Kern County, these vegetation types are habitat for a wide variety of sensitive biological resources including federal and state listed species. Sensitive species such as the San Joaquin kit fox (*Vulpes macrotis mutica*), giant kangaroo rat (*Dipodomys ingens*), San Joaquin antelope squirrel (*Ammospermophilus nelsoni*), blunt-nosed leopard lizard (*Gambelia sila*), Swainson's hawk (*Buteo swainsoni*), golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), California jewelflower (*Caulanthus californicus*), Kern mallow (*Eremalche kernensis*), and Hoover's eriastrum (*Eriastrum hooveri*) are found in western Kern County.

SITE VICINITY DESCRIPTION

La Paloma has provided an extensive list of sensitive species that potentially occur in the project area (LPGP 1998a, AFC pages 5.6-5 and 5.6-6, Table 5.6-1). A complete list of plants, wildlife, and natural communities seen during 1998 field surveys can be found in the Biological Assessment, Attachment A (LPGP 1998a, Addendum II).

POWER PLANT SITE

The proposed 23-acre power plant site is comprised of 20.7-acres of non-native grassland and 2.3-acres of valley saltbush scrub habitat characterized by saltbush (*Atriplex* spp). The project site, and surrounding areas, has a history of use by oil development as evidenced by the presence of oil wells on the project site as well as on adjacent parcels. The non-native grassland and saltbush scrub habitat types are habitat for sensitive species such as the blunt-nosed leopard lizard and the San Joaquin kit fox, both federal and state-listed species, and the San Joaquin antelope squirrel, a state-listed species.

POWER PLANT LAYDOWN AREA

A 23.3-acre laydown area will also be temporarily disturbed during power plant construction. The laydown area located immediately adjacent to the proposed power plant site, is comprised of valley saltbush scrub and non-native grassland habitats.

NATURAL GAS SUPPLY PIPELINE CORRIDOR

The proposed 370-foot natural gas supply pipeline corridor contains a small amount of valley saltbush scrub habitat. However, the proposed natural gas pipeline will be located primarily in an existing dirt roadway.

TRANSMISSION LINE CORRIDORS

Two alternative transmission lines, Route 1 and Route 1A, were identified on Map 3.2-1 in the AFC. Route 1 is 13.6-miles long, while Route 1A is 14.2-miles long. A third transmission line alternative (Route 1B, 1.3 miles in length) has also been proposed as the preferred route to avoid impacting the California Department of Fish and Game's Lokern Ecological Reserve. The transmission line corridor for all of the ~~both~~ alternative routes is comprised predominantly of valley saltbush scrub habitat, however a small percentage of the corridor includes some valley alkali sink habitat. Valley alkali sink habitat is characterized by native shrub species such as iodine bush (*Allenrolfea occidentalis*) and seepweed (*Suaeda* sp.). Along the transmission line corridors many seasonally wet depressions are also found. These depressions are not classified as vernal pools, however they do contain some vernal pool invertebrate species including fairy shrimp (*Branchinecta* spp.). In addition to these native habitats, approximately one-third of the proposed transmission line corridor will be located in agricultural lands.

The proposed transmission line corridors will parallel an existing transmission line corridor and traverse the Lokern Natural Area. The Lokern Natural Area contains two protected areas, the Lokern Preserve managed by the Center for Natural Lands Management (CNLM), a private conservation organization, and the Lokern Ecological Reserve managed by the California Department of Fish and Game (CDFG). The Lokern Natural Area was first established as a high priority area for a long list of state and federally listed species. Representatives of several public agencies and private landowners, including the California Energy Commission, the Bureau of Land Management (BLM), CDFG, the U. S. Fish and Wildlife Service (USFWS), and CNLM work cooperatively as the Lokern Cooperative Group to protect and manage the publicly and privately owned lands within the Lokern Natural Area. The Energy Commission is a signatory of the Memorandum-of-Understanding developed to help guide the management of the habitat.

POTABLE WATER SUPPLY PIPELINE CORRIDOR

The potable water supply pipeline corridor is approximately 1.5-miles long, and is comprised primarily of valley saltbush scrub habitat and ruderal areas. Ruderal areas experience frequent human disturbance and are dominated by a variety of native and non-native annual plant species.

RAW WATER SUPPLY PIPELINE CORRIDORS

Two possible raw water supply pipeline routes have been identified as Route 2 and Route 3. Route 2, proposed to parallel Highway 58, is 8.7-miles long, will traverse primarily valley saltbush scrub habitat, in addition to some non-native grassland habitat. Raw water supply pipeline Route 3 would parallel transmission line Route 1 (see above), and traverse valley saltbush scrub habitat. Route 3 also would traverse the Lokern Natural Area that includes the Lokern Preserve and the Lokern Ecological Reserve, which are managed by the Center for Natural Lands Management and CDFG, respectively. As with the transmission line corridor, the proposed raw water pipeline corridor contains many seasonally wet depressions that contain vernal pool invertebrate species such as fairy shrimp (*Branchinecta* spp.). Whichever route is utilized, a turnout

at the California Aqueduct will need to be constructed in addition to a new 700,000-gallon water storage tank.

IMPACTS

PROJECT SPECIFIC IMPACTS

In the revised Biological Assessment (LPGP 1998a, Addendum II) Table 5-1 provided a complete summary of the project's temporary and permanent impacts by project component. Table 3-9 of the LPGP Supplement 1 (LPGP 1998a, Addendum IV, pages 3-12 to 3-15 and Addendum X, pages 1-10) provides updated acreages for all biological resource habitat impacts including changes to the raw water supply pipeline and water storage tank. The following table identifies the anticipated project-related acreage impacts.

BIOLOGICAL RESOURCES Table 1
Acreage Impacts

	Permanent Impacts (acres)	Temporary Impacts (acres)
Power plant	23	0
Laydown area	0	23.3
Transmission line (Route 1)	2.3	22.6
Transmission line (Route 1A)	2.3	22.6
Transmission line (Route 1B)	3.4	26.2
Raw water pipeline (Route 2)	0.5	65.0
Raw water pipeline (Route 3)	0.5	62.6
Water storage tank	0.5	0
Potable water pipeline	0	10.9
Natural gas pipeline	0	0.44

When all the preferred alternatives of the various components (using Route 1B for the transmission line route) of the project are considered, it is expected that 27.4-acres of habitat will be permanently impacted and 125.8-acres of habitat will be temporarily impacted. LPGP construction and/or operation may directly impact individuals of the following sensitive species and/or the habitat on which they depend:

BIOLOGICAL RESOURCES Table 2

Sensitive Species

Sensitive Plants	Status*
Lost Hills crownscale (<i>Atriplex vallicola</i>)	CNPS List 1B
Recurved larkspur (<i>Delphinium recurvatum</i>)	CNPS List 1B
Hoover's eriastrum (<i>Eriastrum hooveri</i>)	CNPS List 1B/FT
Tejon poppy (<i>Eschscholzia lemmonii</i> ssp. <i>kernensis</i>)	CNPS List 1B
Kern mallow (<i>Eremalche parryi</i> ssp. <i>kernensis</i>)	CNPS List 1B/FE

Sensitive Wildlife	Status
Tricolored blackbird (<i>Agelaius tricolor</i>)	SSC
LeConte's thrasher (<i>Toxostoma lecontei macmillanorum</i>)	SSC
California condor (<i>Gymnogyps californianus</i>)	SE/FE
Golden eagle (<i>Aquila chrysaetos</i>)	SC
Swainson's hawk (<i>Buteo swainsoni</i>)	ST
Long-eared owl (<i>Asio otus</i>)	SSC
Burrowing owl (<i>Athene cunicularia</i>)	SSC
Northern harrier (<i>Circus cyaneus</i>)	SSC
Yellow warbler (<i>Dendroica petechia</i>)	SSC
White-tailed kite (<i>Elanus caeruleus</i>)	FP
California horned lark (<i>Eremophila alpestris actia</i>)	SSC
Prairie falcon (<i>Falco mexicanus</i>)	SSC
Loggerhead shrike (<i>Lanius ludovicianus</i>)	SSC
Blunt-nosed leopard lizard (<i>Gambelia sila</i>)	SE/FE/FP
San Joaquin coachwhip (<i>Masticophis flagellum ruddocki</i>)	SSC
Western spadefoot toad (<i>Scaphiopus hammondi hammondi</i>)	SSC
Giant kangaroo rat (<i>Dipodomys ingens</i>)	SE/FE
Short-nosed kangaroo rat (<i>Dipodomys nitratoides brevinasus</i>)	SSC
Tulare grasshopper mouse (<i>Onychomys torridus tularensis</i>)	SSC
San Joaquin pocket mouse (<i>Perognathus inornatus inornatus</i>)	SSC
San Joaquin antelope squirrel (<i>Ammospermophilus nelsoni</i>)	ST
San Joaquin kit fox (<i>Vulpes macrotis mutica</i>)	ST/FE
American badger (<i>Taxidea taxus</i>)	SSC
Longhorn fairy shrimp (<i>Branchinecta longiantenna</i>)	FE
Vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	FE
Vernal pool tadpole shrimp (<i>Lepidurus packardii</i>)	FT

* **Status legend:** CNPS List 1B = Plants rare or endangered in California and elsewhere (California Native Plant Society 1994), SSC = Species of Special Concern (CDFG 1992), FE = Federally listed Endangered, FT = Federally listed Threatened, SE = State listed Endangered; ST = State listed Threatened and FP = State Fully Protected.

POWER PLANT SITE AND LAYDOWN AREA

Construction of the power plant will result in the permanent loss of 20.7-acres of non-native grassland habitat and 2.3-acres of saltbush scrub habitat, or a total of 23-acres. During project construction, a 23.3-acre laydown area will be needed. Use of the project laydown area will result in the temporary disturbance of 10-acres of non-native grassland habitat and 13.3-acres of valley saltbush scrub habitat. These habitat types are occupied by blunt-nosed leopard lizards and San Joaquin kit foxes, both federal and state-listed species, and San Joaquin antelope squirrels, a state-listed species. The blunt-nosed leopard lizard is also a Fully Protected species.

TRANSMISSION LINE

Construction of either of the transmission line alternatives [Route 1 (13.6-miles) and Route 1A (14.2-miles)] would result in temporary habitat disturbance, permanent habitat loss, and a potential for impacts to individual species during project construction. There is also the likelihood that individual species will be impacted along access roads that will be used during construction of the transmission line. A variety of sensitive species are found in the region. Blunt-nosed leopard lizards, giant kangaroo rats, Tipton kangaroo rats, San Joaquin kit foxes, San Joaquin ground squirrel, Kern mallow, recurved larkspur, Hoover's eriastrum and other sensitive species are found in both transmission line corridors.

The preferred transmission line corridor (Route 1) will parallel an existing transmission line corridor. Short access roads will be needed during transmission line construction and maintenance activities. Access road development and installation of transmission line towers will permanently impact 2.32-acres of habitat (2.18-acres of valley saltbush scrub and 0.14-acres of alkali sink scrub). A total of 22.6-acres of habitat (21.6-acres of valley saltbush scrub and 1.0-acre of alkali sink scrub) will be temporarily impacted during construction of either transmission line route.

If Route 1B is constructed, access via existing dirt roads will be used when possible. Approximately 1 mile of the Route 1B alignment contains no convenient road and an ungraded access route along the alignment will be used. An additional 1.05 acres of surface disturbance will occur as a result of the new upgraded access trail during construction. The overall net increase in surface disturbance due to Route 1B is 4.66 acres during construction and 1.08 acres during operation. (LPGP 1998a, Addendum IX)

Some seasonally wet depressions may also be temporarily impacted during installation of the transmission line. It is remotely possible that one or more federally listed vernal pool species such as the vernal pool fairy shrimp (*Branchinecta lynchi*, federally-listed Threatened), the longhorn fairy shrimp (*Branchinecta longiantenna*, federally-listed Endangered), and the vernal pool tadpole shrimp (*Lepidurus packardii*, federally-listed Endangered) could occur in the project area (U. S. Fish and Wildlife Service, 1998).

Transmission line Route 1 will cross the CNLM Lokern Preserve and the CDFG Lokern Ecological Reserve as it parallels an existing transmission line corridor. La Paloma is negotiating a Memorandum-of-Understanding with CNLM to obtain an easement so the transmission line can be located on CNLM land and La Paloma can have access to the preserve for required transmission line maintenance activities. Route 1 also crosses the Lokern Natural Area, a planning area established by state and federal agencies, Kern County, and private landowners specifically to work together to decide how best to protect sensitive species habitats in this portion of western Kern County.

For a map of the Lokern Natural Area and other protected areas in the vicinity of the proposed project, see Biological Resources **Figure 1**.

Biological Resources - FIGURE 1

LOKERN NATURAL AREA AND OTHER SENSITIVE AREAS (Source: Energy Commission Cartography Unit)

Whereas CNLM is willing to negotiate an agreement with La Paloma so the transmission line can cross CNLM land, CDFG regulations do not allow the granting of easements for facilities such as transmission lines in state ecological reserves when surface disturbances will occur. A transmission line corridor currently crosses the CDFG Lokern Ecological Reserve; however, the corridor was established prior to the establishment of the ecological reserve. State ecological reserves are established principally to protect sensitive species and their habitats, so CDFG must make certain that these areas are not impacted. For this reason, La Paloma intends to avoid the state ecological reserve by rerouting their transmission line around the protected area. This alternative transmission line route is identified as Route 1B.

The Energy Commission regulations also states that protected areas should be avoided by energy development. Section 25527 of The Warren-Alquist Act states that protected areas "shall not be approved as a site for an energy facility, unless the commission finds that such use is not inconsistent with the primary uses of such lands and that there will be no substantial adverse environmental effects and the approval of any public agency having ownership or control of such lands is obtained."

Regarding mitigation, La Paloma intends to mitigate all temporary and permanent impacts to CNLM property at higher habitat compensation ratios (2.1:1 for temporary impacts and 4:1 for permanent impacts) since impacts to protected lands are mitigated at higher ratios than impacts to other natural lands. In addition, all LPGP habitat compensation purchases and the associated endowment, will be provided by La Paloma to CNLM, and become part of CNLM's Lokern Preserve within the Lokern Natural Area of western Kern County.

Staff always strives to make certain that all protected areas are avoided when energy development occurs. However, in certain circumstances impacts may be unavoidable, so approvals need to be arranged to allow the impacts to occur and agreed upon mitigation implemented. For this project, La Paloma is able to avoid the CDFG Lokern Ecological Reserve to avoid impacting the protected area. For the Lokern Preserve, La Paloma is able to develop an agreement with CNLM to allow for the construction and maintenance of the transmission line and towers. In addition, La Paloma has agreed to minimize their impacts as much as possible during construction and operation of the new transmission line and more than adequately compensate for any unavoidable temporary and permanent impacts.

Staff feels that the transmission line and towers will not be inconsistent with the primary uses of the CNLM Lokern Preserve, and the proposed habitat compensation mitigation to be provided by La Paloma will be more than adequate to compensate for the project temporary and permanent impacts. As a result, staff is comfortable with the proposed methods for resolving this difficult situation.

WATER SUPPLY PIPELINES

RAW WATER SUPPLY PIPELINE AND WATER STORAGE TANK

Supplying raw water to the power plant for cooling will require the construction of a water supply pipeline that connects the power plant to the California Aqueduct and a

700,000-gallon water storage tank. As with the transmission line routes, there is an extensive list of sensitive species found within each raw water supply pipeline corridor route. Raw water supply pipeline Route 2 (8.7-miles) would parallel Highway 58, and Route 3 (8.4-miles) would parallel proposed transmission line Route 1.

Permanent and temporary impact acreage amounts for the raw water supply pipeline, the California Aqueduct turnout, and the water storage tank are based upon amounts found in Table 3-9 of Supplement 1 to the Application for Certification (LPGP 1998a, Addendum IV, pages 3-12 to 3-15).

Construction of the Route 2 water supply pipeline will result in the permanent loss of 0.5-acres of valley saltbush scrub habitat at the California Aqueduct turnout site. In addition, construction of the Route 2 water supply pipeline will also result in the temporary disturbance of 65.0-acres (62.6-acres of valley saltbush scrub and 2.9-acres of non-native grassland). Species expected to occur in the Route 2 corridor include a variety of sensitive species including the blunt-nosed leopard lizard, Hoover's eriastrum, recurved delphinium, San Joaquin kit fox, and the San Joaquin ground squirrel.

If Route 3 is utilized, construction of the California Aqueduct turnout will result in the permanent loss of 0.5-acres of valley saltbush scrub habitat. For construction of the entire Route 3 raw water supply pipeline corridor, there would be temporary disturbance of 62.5-acres of valley saltbush scrub habitat. In addition to the species identified for the Route 2 corridor, the giant kangaroo rat would also be expected to occur within the Route 3 corridor.

If Route 3 is utilized, La Paloma will also need to acquire easements from CNLM and CDFG since the pipeline route will cross the CNLM Lokern Preserve and the CDFG Lokern Ecological Reserve. For a more complete discussion of the problems associated with acquiring these easements, see the **Transmission Line** section above.

Construction of raw water supply pipeline Route 2 or Route 3 will require the construction of a new 700,000-gallon water storage tank, and result in the permanent loss of 0.5-acres of valley saltbush scrub habitat.

As with the construction of the transmission line, there will be some temporary impacts to some seasonally wet depressions that contain species such as fairy shrimp (*Branchinecta* spp.). It is remotely possible that the vernal pool fairy shrimp (*Branchinecta lynchi*), a federally listed endangered invertebrate species, and other protected invertebrate species (see complete species list in **Transmission Line** discussion above) could occur in the project area and, as a result, be impacted by project construction.

A potential biological resource issue associated with the removal of water from the California Aqueduct is the potential impacts to the delta smelt (*Hypomesus transpacificus*), a federally listed Threatened fish species. Since La Paloma is proposing to utilize West Kern Valley Water District "banked" water and not require an increase in the amount of water withdrawal above the current, permitted West Kern Valley Water District water withdrawal amount, staff concludes that the delta smelt will not be affected by LPGP.

POTABLE WATER SUPPLY PIPELINE

The potable water supply pipeline route is much shorter than either raw water supply pipeline route. The potable water supply pipeline will be 1.5-miles long, and there will not be any permanent loss of habitat associated with the construction, operation or maintenance of the pipeline. However, there will be some temporary disturbance of habitat during construction.

Construction of the potable water supply pipeline will result in the temporary disturbance of 10.9-acres of habitat (7.3-acres of valley saltbush scrub and 3.6-acres of ruderal habitat). Species expected to occur in the region of the potable water supply pipeline are the San Joaquin kit fox, San Joaquin antelope squirrel, and the blunt-nosed leopard lizard. Once the potable water supply pipeline is constructed, no additional impacts are expected as a result of the operation and maintenance of the potable water supply pipeline.

NATURAL GAS PIPELINE

Construction of the 0.07-mile natural gas pipeline will result in temporary impacts to 0.44-acres of valley saltbush scrub habitat. Once the natural gas pipeline is constructed, no impacts are expected during operation and maintenance of the pipeline.

CUMULATIVE IMPACTS

“Cumulative impacts” are defined as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” (California Environmental Quality Act Guidelines, section 15355)

TRANSMISSION LINE

The installation of an additional transmission line in an area where existing transmission lines are known to be causing significant biological resource impacts (e.g., bird collisions with existing transmission lines/towers located within a well established bird migratory flyway) may represent a cumulative impact, and require additional mitigation. The existing transmission line corridor does not currently pose that sort of threat to local biological resources.

However, if the LPGA transmission line is installed within the current transmission line corridor there will be a total of three transmission lines that cross the Lokern Natural Area. Staff is concerned about this ever-widening transmission line corridor since the temporary and permanent impacts associated with transmission line access roads are beginning to diminish the value of the habitat and conflict with the overall goal to protect the habitat in the Lokern area.

Staff is not recommending additional mitigation for cumulative impacts to biological resources by La Paloma because the applicant’s mitigation for temporary and permanent impacts is exemplary. La Paloma is proposing to utilize the existing corridor because they do not want to create a new corridor that would result in far larger temporary and permanent impacts. However, new energy project proponents that are considering projects in this portion of western Kern County (e.g. Elk Hills Power Project,

Midway-Sunset, and Sunrise Cogeneration and Power Project) need to understand that staff will give careful consideration to requiring additional mitigation for cumulative impacts if any future projects choose to locate their transmission lines within the corridor that currently bisects the Lokern Natural Area.

However, if future projects do choose to utilize the existing corridor that crosses the Lokern Natural Area and ends at the Buttonwillow substation, staff will argue that impacts, as well as mitigation costs, can be significantly minimized by encouraging future applicants to hang any new transmission conductors from existing transmission line towers (such as those constructed for the LPGP transmission line, if it is constructed). Implementation of this strategy will stop the continual widening of the transmission corridor and the need for additional access roads associated with new transmission lines.

FACILITY CLOSURE

Sometime in the future, the LPGP facility will experience either a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety. To address facility closure, an “on-site contingency plan” will be developed by the project owner, and approved by the Energy Commission Compliance Project Manager (See **General Conditions** section in **Facility Closure** and Biological Resources Condition of Certification **BIO-11**).

PLANNED OR UNEXPECTED PERMANENT FACILITY CLOSURE

The region surrounding the proposed project site is a mosaic of disturbed and undisturbed valley saltbush scrub and non-native annual grassland habitats. The undisturbed and disturbed habitats are dominated by native and non-native plant species that provide food and cover for the associated species including several protected plant and wildlife species. Since the proposed project area currently provides habitat for these species, the facility closure plan needs to address habitat restoration measures to be implemented in the event of a planned or an unexpected permanent closure. Habitat restoration measures that should be addressed include such tasks as the removal of all power plant site structures and the immediate implementation of habitat restoration measures to re-establish native habitat types (e.g. valley saltbush scrub). In addition, planned or unexpected permanent facility closure may also trigger the removal of the transmission conductors, and possibly the entire transmission line, since birds are known to collide with transmission conductors.

UNEXPECTED TEMPORARY CLOSURE

Staff does not have any biological resource facility closure recommendations in the event of an unexpected temporary closure of the LPGP facility. However, in the event that the Energy Commission CPM decides that the facility is permanently closed, the above-mentioned facility closure measures need to be given careful consideration.

MITIGATION

La Paloma has developed a mitigation strategy that maximizes the avoidance of impacts to sensitive species and their habitats. Where avoidance is not possible, La Paloma has proposed that a habitat compensation program, for both temporary and permanent impacts, be implemented. In the AFC (LPGP 1998a, AFC pages 5.6-28 to 5.6-39, section 5.6.3 and LPGP 1998a, Addendum II, pages 7-1 to 7-10) La Paloma has provided mitigation strategies for project design and siting, pre-construction, construction, post-construction, operation and maintenance activities. La Paloma's proposed mitigation measures include items such as avoidance of wetlands, designing/building transmission line towers to minimize bird electrocutions, implementing a worker environmental awareness program, designation of a biologist to oversee all biological resource mitigation measures, implementation of sensitive species take avoidance measures, minimizing permanent impacts to habitat, monitoring all activities that could result in incidental take of a sensitive species, implementation of a habitat reclamation plan once temporary habitat disturbance is completed, prohibiting firearms and pets from the project site, minimizing the use of rodenticides and herbicides in the project area, and acquiring compensation lands to satisfy the requirements of state and federal endangered species acts. For a complete list of the mitigation proposed by La Paloma, see Biological Resources Condition of Certification **BIO-1**.

To make certain that all proposed mitigation measures are properly implemented during project construction and operation, La Paloma will inform its workers about the sensitive biological resources in the project region (Worker Environmental Awareness Program) and create a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). The BRMIMP, when finalized prior to the beginning of any project-related habitat disturbance, will identify:

- specific take avoidance measures to protect sensitive species during project construction;
- information about a Worker Environmental Awareness Program that will be implemented during project construction and operation to make certain all workers understand the environmental, and in particular the biological resource sensitivities, of the project;
- specific measures to avoid sensitive species impacts during project operation (e.g. speed limits, no firearms allowed at the project site, and trash control);
- measures to be implemented to rehabilitate temporarily disturbed areas; and
- the amount of habitat compensation, and associated endowment, that will be provided by La Paloma to compensate for permanent and temporary habitat impacts.

For details about the Worker Environmental Awareness Program and the BRMIMP, see Biological Resources Conditions of Certification **BIO-5** and **BIO-9**.

LA PALOMA HABITAT COMPENSATION

To assist in the calculation of the amount of habitat compensation, habitat compensation ratio requirements have been provided by the USFWS and CDFG, and will be utilized by La Paloma. The habitat compensation ratios (number of acres to be purchased per acre impacted) to be utilized by La Paloma are:

<u>Impacts</u>	<u>Compensation Ratio</u>
Permanent impacts to natural lands	3.0:1
Temporary impacts to natural lands	1.1:1
Permanent impacts to protected lands	4.0:1
Temporary impacts to protected lands	2.1:1

Natural lands are defined as any habitat that contains a variety of native and non-native plant species for food and/or cover and are available for wildlife usage. *Protected lands* are defined as those areas, for this particular project, that are currently protected by the Bureau of Land Management, CDFG, and the (CNLM).

As of March 16, 1999, La Paloma has identified that 27.4-acres will be permanently impacted and 125.8-acres will be temporarily impacted by the project. A complete and updated listing of impact acreage amounts can be found in the La Paloma addendum (LPGP 1998a, Addendum IX, Table 3.4-2, pages 3-6 to 3-8).

Based upon expected impact acreage amounts and the application of the habitat compensation ratios mentioned above, La Paloma intends to purchase at least 246.5-acres in the immediate vicinity of the Lokern Preserve within the Lokern Natural Area of western Kern County (LPGP 1998a, Addendum IX). The Lokern Preserve is located approximately 3 air miles north of the proposed power plant site, and contains the same habitat types and sensitive species that will be impacted during LPGP construction. The Lokern Preserve was originally established by The Nature Conservancy in the late 1980's, however it is now owned and managed by CNLM, a private, non-profit organization dedicated to the protection and management of natural resources.

Once the mitigation acreage is purchased, La Paloma will deed all the acreage to CNLM. Prior to compensation habitat purchase, La Paloma will also work with CNLM to decide on the amount of funds to be provided by La Paloma to CNLM to be used as an endowment for the in perpetuity preservation and management of the compensation habitat. As of this staff assessment, CNLM requires \$110 per acre for initial and capital funds, and \$330 per acre for the endowment. For additional information about habitat compensation, refer to Biological Resources Condition of Certification **BIO-10**.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

To be in compliance with applicable laws, ordinances, regulations and standards, La Paloma must obtain an endangered species take permit and two biological opinions - 1) a Section 7 consultation and resulting Biological Opinion from the USFWS and 2) a Section 2081.1 Biological Opinion and take permit from CDFG. These documents will

identify mitigation measures required by each regulatory agency. For further information on these documents, see Biological Resources Conditions of Certification **BIO-6** and **BIO-7**.

In addition, a CDFG Streambed Alteration Agreement will be required for impacts to seasonal watercourses that are associated with construction of the transmission line and raw water supply pipeline. For details about the Streambed Alteration Agreement, see Biological Resources Condition of Certification **BIO-8**.

La Paloma has stated that all jurisdictional wetlands will be avoided, so a U. S. Army Corps of Engineers Section 404 permit will not be required for this project.

To help the project owner comply with laws, ordinances, regulations, and standards and the biological resource mitigation measures associated with this project, La Paloma must designate a biological resource specialist (the Designated Biologist), prior to the beginning of any project-related ground disturbance, who is familiar with the biological resource issues of the project area. The Designated Biologist will help the project owner make certain that all mitigation measures are complied with during project construction and operation. For details about the roles and responsibilities of the Designated Biologist, see Biological Resource Conditions of Certification **BIO-2**, **BIO-3**, and **BIO-4**.

CONCLUSIONS-AND RECOMMENDATIONS

CONCLUSIONS

Construction and operation of the project will not have significant impacts on local biological resources if adequately mitigated. For those project impacts identified, mitigation measures proposed by the applicant, staff, and federal and state wildlife protection agencies will reduce project impacts to insignificant levels.

Approval of the final BRMIMP will be completed prior to the beginning of project construction. The final BRMIMP will be developed in consultation with the project owner, Energy Commission, USFWS, CDFG staff, and anyone else interested in participating in a meeting(s) that will be scheduled to finalize the BRMIMP details.

RECOMMENDATIONS

Staff and the applicant's biologists have repeatedly consulted with CDFG and USFWS biologists during this power plant siting process. These discussions were held to make certain that the mitigation recommended by the applicant was appropriate for the anticipated impacts associated with this project. Agency biologists have reviewed various drafts of the LPGP Biological Resources Mitigation Implementation and Monitoring Plan, the LPGP Biological Assessment, and staff's Preliminary and Final Staff Assessments, and have found these documents to be more than adequate in addressing anticipated project-related impacts and proposed mitigation measures.

Staff has also reviewed a draft of the CDFG Incidental Take Permit and talked to USFWS staff about their final Biological Opinion for the La Paloma project. As a result

of these conversations, staff concludes that CDFG and USFWS will provide their required mitigation measures, and that La Paloma biological resource personnel will abide by the requirements specified by these agencies and will be in compliance with all state and federal endangered species regulations.

Staff recommends that the Energy Commission adopt the following Biological Resources Conditions of Certification.

CONDITIONS OF CERTIFICATION

The following Conditions of Certification are proposed by staff. The CDFG Incidental Take Permit will outline the mitigation measures (e.g. sensitive species take avoidance measures and habitat compensation requirements) to be followed by La Paloma prior to and during project construction and operation. See Biological Resource Condition of Certification **BIO-6** for more details about the CDFG permit. The USFWS Biological Opinions will, as will the Incidental Take Permit, provide mitigation requirements that must be followed prior to project construction, and during construction and operation. For more information about the USFWS Biological Opinion, see Biological Resource Conditions of Certification **BIO-7**.

APPLICANT'S MITIGATION

BIO-1 The project owner will implement the following mitigation measures identified in Section 5.6.3.1 found on pages 5.6-28 to 5.6-38 of the LPGP Application for Certification (LPGP 1998a). The project owner's proposed mitigation measures will be incorporated into the final Biological Resources Mitigation Implementation and Monitoring Plan (see Condition of Certification **BIO-9**, below) unless the mitigation measures conflict with mitigation required by the U. S. Fish and Wildlife Service and the California Department of Fish and Game that is contained in their respective Biological Opinions.

Protocol: The project owner will:

1. Site transmission line poles, access roads, pulling sites, and storage and parking areas to avoid sensitive resources whenever possible.
1. Avoid all wetlands.
2. Design and construct transmission lines and poles to reduce the likelihood of electrocutions of large birds.
3. Bury any pipelines that cross streams and dry creek beds below the scour depth for each waterway. Streambeds disturbed during construction will be recontoured so that drainage patterns are not changed from pre-construction conditions.
4. Implement a Worker Environmental Awareness Program.

5. Hire a qualified biologist, that is acceptable to Energy Commission, USFWS, and CDFG staff to conduct pre-construction surveys no more than 14 days prior to initiation of construction in any portion of the project area.
6. Implement CDFG approved take avoidance measures for the blunt-nosed leopard lizard.
7. Clearly mark construction area boundaries with stakes, flagging, and/or rope or cord to minimize inadvertent degradation or loss of adjacent habitat during facility construction. All equipment storage will be restricted to designated construction zones or areas that are currently not considered sensitive species habitat.
8. Post signs and/or fence the power plant site and laydown areas to restrict vehicle access to designated areas.
9. Institute traffic restraints and signs to minimize temporary disturbances. A 20-mph speed limit will be implemented on the project site.
10. Designate a specific individual as a contact representative between La Paloma, USFWS, Energy Commission, and CDFG to oversee compliance with mitigation measures detailed in the Biological Opinion.
11. Provide a qualified wildlife biologist to monitor all activities that may result in incidental take of listed species or their habitat.
12. Conduct compliance inspections once per week and provide an annual compliance report to the Energy Commission, the USFWS Sacramento Field Office, and the CDFG Region 4 office.
13. Limit transmission line construction to daylight hours. For areas of high concentrations of nocturnal sensitive species (giant kangaroo rat, San Joaquin kit fox, Tipton kangaroo rat), work activities will be minimized during nighttime hours. Night lighting will be hooded.
14. Provide wildlife escape ramps for construction areas that contain steep-walled holes or trenches.
15. Fence open holes or trenches within 50-feet of giant kangaroo rat burrows. Fence will be hardware cloth or similar materials that are approved by USFWS and CDFG.
16. Inspect trenches each morning for entrapped animals prior to the beginning of construction. Construction will be allowed to begin only after trapped animals are able to escape voluntarily.

17. Inspect all construction pipes, culverts, or similar structures with a diameter of 4-inches or greater for kit foxes prior to pipe burial. Pipes to be left in trenches overnight will be capped.
18. Provide a post-construction compliance report, within 45 calendar days of completion of the project, to the USFWS, CDFG and the Energy Commission.
19. Complete, and institute, a habitat reclamation plan once temporarily disturbed habitat disturbance is completed. Annual inspections will occur for three years to check for compliance with the reclamation plan goals.
20. Make certain that all food-related trash will be disposed of in closed containers and removed at least once a week. Feeding of wildlife will be prohibited.
21. Prohibit firearms except for those carried by security personnel.
22. Prohibit pets from the project site.
23. Minimize the use of rodenticides and herbicides in the project area.
24. Report all inadvertent deaths of San Joaquin kit fox, San Joaquin antelope squirrel, giant kangaroo rat, or blunt-nosed leopard lizard to the appropriate La Paloma representative. Injured animals will be reported to CDFG, and follow instructions that are provided by CDFG.
25. Consult with USFWS, CDFG, and Energy Commission staff regarding appropriate protection measures for sensitive species following resolution of any emergency situation that takes place in sensitive habitat during clean-up activities; and
26. Acquire compensation lands to satisfy the requirements of state and federal endangered species acts, consistent with standard USFWS and CDFG compensation requirements for impacts to listed species habitats.

Verification: At least 60 days prior to start of any project related ground disturbance activities, the project owner shall provide the Energy Commission Compliance Project Manager (CPM) with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability within 15 days of receipt of the final plan. Implementation of the above measures will be included in the BRMIMP.

DESIGNATED BIOLOGIST

BIO-2 Construction site and/or ancillary facilities preparation (described as any ground disturbing activity other than allowed geotechnical work) shall not begin until an Energy Commission CPM approved Designated Biologist is available to be on site.

Protocol: The Designated Biologist must meet the following minimum qualifications:

1. a Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
3. one year of field experience with biological resources found in or near the project area; and
4. an ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resources tasks that must be addressed during project construction and operation.

If the CPM determines the proposed Designated Biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved Designated Biologist needs to be replaced, the project owner shall obtain approval of a new Designated Biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No disturbance will be allowed in any designated sensitive areas until the CPM approves a new Designated Biologist and the new Designated Biologist is on site.

Verification: At least 90 days prior to the start of any ground disturbance activities, the project owner shall submit to the CPM for approval, the name, qualifications, address and telephone number of the individual selected by the project owner as the Designated Biologist. If a Designated Biologist is replaced, the information on the proposed replacement as specified in the condition must be submitted in writing at least ten working days prior to the termination or release of the preceding Designated Biologist.

BIO-3 The CPM approved Designated Biologist shall perform the following during project construction and operation:

5. Advise the project owner's supervising construction or operations engineer on the implementation of the biological resource conditions of certification,

6. Supervise or conduct mitigation, monitoring and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as, wetlands and special status species, and

7. Notify the project owner and the CPM of any non-compliance with any biological resources condition of certification.

Verification: During project construction, the Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

BIO-4 The project owner's supervising construction and operations engineer shall act on the advice of the Designated Biologist to ensure conformance with the biological resources conditions of certification.

Protocol: The project owner's supervising construction and operating engineer shall halt, if necessary, all construction activities in areas specifically identified by the Designated Biologist as sensitive to assure that potential significant biological resource impact are avoided.

The Designated Biologist shall:

8. Inform the project owner and the supervising construction and operating engineer when to resume construction, and
9. Advise the CPM if any corrective actions are needed or have been instituted.

Verification: Within two working days of a Designated Biologist notification of non-compliance with a Biological Resources condition or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-5 The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program in which each of its employees, as well as employees of contractors and subcontractors who work on the

project site or related facilities (including any access roads, storage areas, transmission lines, water and gas lines) during construction and operation, are informed about sensitive biological resources associated with the project.

Protocol: The Worker Environmental Awareness Program must:

1. be developed by the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;
2. discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. present the reasons for protecting these resources;
4. present the meaning of various temporary and permanent habitat protection measures; and
5. identify whom to contact if there are further comments and questions about the material discussed in the program.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

Verification: At least 60 days prior to the start of rough grading, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the Designated Biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six (6) months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six (6) months after their termination.

CALIFORNIA DEPARTMENT OF FISH & GAME INCIDENTAL TAKE PERMIT

BIO-6 Prior to start of any ground disturbance activities, the project owner shall acquire an Incidental Take Permit from the California Department of Fish

and Game (CDFG) (per Section 2081(b) of the California Endangered Species Act) and implement the permit terms and conditions.

Verification: At least 60 days prior to the start of any project related ground disturbance activities the project owner shall submit to the CPM a copy of the final CDFG Incidental Take Permit. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan. (See also Condition of Certification **BIO-9**.)

U. S. FISH & WILDLIFE SERVICE SECTION 7 BIOLOGICAL OPINION

BIO-7 Prior to the start of any ground disturbance activities, the project owner shall provide final copies of the Biological Opinion per Section 7 of the federal endangered species act obtained from the U. S. Fish and Wildlife Service and incorporate the terms of the agreement into the Biological Resources Mitigation Implementation and Monitoring Plan. The project owner will implement the terms and conditions contained in the Biological Opinion (See also Condition of Certification **BIO-9**.)

Verification: At least 60 days prior to the start of any project related ground disturbance activities the project owner shall submit to the CPM a copy of the Biological Opinion. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan. (See also Condition of Certification **BIO-9**.)

CALIFORNIA DEPARTMENT OF FISH & GAME STREAMBED ALTERATION AGREEMENT

BIO-8 The project owner shall implement the provisions of the California Department of Fish and Game Streambed Alteration Agreement contained in Notification #4-176-98.

Protocol: California Department of Fish and Game Streambed Alteration Agreement provisions contained in Notification #4-176-98 will be included in the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) (See also Condition of Certification **BIO-9**.)

Provisions in the CDFG Streambed Alteration Agreement Notification #4-176-98 include:

1. Completion of all work in the streams when the work sites are dry;
2. Not removing or damaging woody perennial stream bank vegetation outside of the work area;
3. Not removing soil, vegetation, and vegetative debris from the streambed or stream banks;

4. Not exceeding the amount of fill placed within stream channels above that which naturally occurred in the stream channel prior to the start of work;
5. Not creating silty or turbid water when water returns to the stream, and not discharging silty water into the stream, nor creating turbid water within the stream;
6. Stabilizing slopes toward the stream to reduce erosion potential;
7. Locating equipment, material, fuel, lubricant and solvent staging and storage areas outside the stream, and using drip pans with motors, pumps, generators, compressors, and welders that are located within or adjacent to a stream;
8. Moving all vehicles away from the stream prior to refueling and lubricating;
9. Preventing any substance that could be hazardous to aquatic life from contaminating the soil and/or entering the waters of the area;
10. Cleaning up all spills immediately; and
11. Returning stream low flow channel, bed, or banks to as nearly as possible to their original configuration and width.

Verification: Streambed Alteration Agreement terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan. (See also Condition of Certification **BIO-9**)

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION & MONITORING PLAN

BIO-9 The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and shall implement the measures identified in the plan.

Protocol: The final BRMIMP shall identify:

1. All mitigation, monitoring and compliance measures recommended by the applicant contained in Condition of Certification BIO-1;
2. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation and closure;

3. All mitigation measures provided in the USFWS Biological Opinion (Condition of Certification BIO-7) and the CDFG Incidental Take Permit (Condition of Certification BIO-6);
4. All provisions specified in the CDFG Streambed Alteration Agreement Notification #4-176-98 (Condition of Certification BIO-8);
5. All required mitigation measures for each sensitive biological resource (including burrowing owl avoidance measures recommended by CDFG in its September 1995 staff report on burrowing owl mitigation);
6. Required habitat compensation, including provisions for acquisition, enhancement and management, for any temporary and permanent loss of sensitive biological resources;
7. A detailed description of measures that will be taken to avoid or mitigate temporary disturbances from construction activities;
8. All locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;
9. Aerial photographs of all areas to be disturbed during project construction activities - one set prior to site disturbance and one set subsequent to completion of mitigation measures. Include planned timing of aerial photography and a description of why times were chosen;
10. Monitoring duration for each type of monitoring and a description of monitoring methodologies and frequency;
11. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
12. All performance standards and remedial measures to be implemented if performance standards are not met;
13. A discussion of biological resource-related facility closure measures; and
14. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval

Verification: At least 60 days prior to start of any project related ground disturbance activities, the project owner shall provide the CPM with the final version

of the BRMIMP for this project, and the CPM will determine the plans acceptability within 15 days of receipt of the final plan. The project owner shall notify the CPM five working days before implementing any modifications to the BRMIMP.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which mitigation and monitoring plan items are still outstanding.

HABITAT COMPENSATION

BIO-10 To compensate for temporary and permanent impacts to sensitive wildlife habitat, the project owner will purchase no less than 246.5-acres of suitable compensation habitat. Title for compensation habitat will be transferred to the Center for Natural Lands Management (CNLM) to be managed as part of the Lokern Preserve. The project owner will also provide a CNLM approved endowment, including land purchase administrative costs and habitat enhancement funds, to CNLM to ensure the perpetual management of the compensation habitat.

Verification: No later than 60 days prior to the start of any project related ground disturbance, the project owner must provide written verification to the CEC CPM that all compensation habitat purchases have been completed, and that title for all the parcels have been transferred to CNLM for management as part of the Lokern Preserve. At the same time, written verification must also be provided that shows that the associated endowment and any other required parcel transfer administrative funds have been deposited into an appropriate CNLM account for the perpetual maintenance of the Lokern Preserve parcels purchased by the project owner for this particular project. Also, a copy of the memorandum of understanding developed by the project owner and CNLM must be provided to the CEC CPM.

Within 90 days after completion of project construction the project owner shall provide the CPM aerial photographs taken after construction and an analysis of the amount of any additional habitat disturbance than that identified in this Energy Commission Final Staff Assessment. The CPM will notify the project owner of any additional funds required to compensate for any additional habitat disturbances at the adjusted market value at the time of construction to acquire and manage habitat.

FACILITY CLOSURE

BIO-11 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the La Paloma BRMIMP. (See Condition of Certification **BIO-9**, above)

Protocol: The planned permanent or unexpected permanent closure plan will address the following biological resource-related mitigation measures:

1. Removal of transmission conductors when they are no longer used and useful;
2. Removal of all power plant site facilities; and
3. Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species.

Verification: At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

REFERENCES

- California Department of Fish and Game. 1992. Bird Species of Special Concern. Unpublished document from the Wildlife Management Division, Nongame Bird and Mammal Section.
- California Environmental Quality Act Guidelines. 1994. Governor's Office of Planning and Research. State of California.
- California Native Plant Society. 1994. Inventory of Rare and Endangered Vascular Plants of California. Special Publication No. 1. 5th edition. 338 pp.
- LPGP (La Paloma Generating Project). 1998a. Application for Certification, La Paloma Generating Project (98-AFC-2). Submitted to the California Energy Commission, August 12.
- LPGP (La Paloma Generating Project). 1998a. Application for Certification, Addendum II, La Paloma Generating Project (98-AFC-2). Supplemental material to Applicant's AFC - Biological Assessment. Submitted to the California Energy Commission, October 27.
- LPGP (La Paloma Generating Project). 1998a. Application for Certification, Addendum IV, La Paloma Generating Project (98-AFC-2). Supplemental material to Applicant's AFC - Biological resources, air quality, water resources, soils, cultural and paleontological resources, traffic and transportation, and visual resources. Submitted to the California Energy Commission, December 7.
- LPGP (La Paloma Generating Project). 1998. Application for Certification, addendum IX, La Paloma Generating Project (98-AFC-2). A supplement that 1) presents a route deviation of the proposed transmission line to go around a California Department of Fish and Game ecological reserve; and 2) revises stack ammonia emissions. Submitted to the California Energy Commission, March 16, 1999.
- LPGP (La Paloma Generating Project). 1998a. Application for Certification, addendum X, La Paloma Generating Project (98-AFC-2). A supplement that presents the biological resource survey of transmission line reroute to avoid the Lokern Ecological Reserve. Submitted to the California Energy Commission, March 17, 1999.
- LPGP (La Paloma Generating Project). 1999 BRMIMP. Biological Resources Mitigation Implementation and Monitoring Plan. Submitted to the California Energy Commission, January 22, 1999.

LPGP (La Paloma Generating Project). 1999. Status report 6, concerning air quality, biological resources, and waste management. Submitted to the California Energy Commission, February 24, 1999.

U. S. Fish and Wildlife Service. 1998. Recovery plan for upland species of the San Joaquin Valley, California. Region 1, Portland, OR. 319 pp.

SOCIOECONOMICS

Revised Testimony of Dale Edwards

INTRODUCTION

A California Energy Commission (Energy Commission) staff socioeconomic impact analysis generally evaluates the project induced changes on community services and/or infrastructure and related community issues such as environmental justice and facility closure. Cumulative impacts are also included. This analysis discusses the potential impacts of the proposed La Paloma project on local communities, community resources, and public services, pursuant to Title 14, California Code of Regulations, Section 15131.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The following LORS are applicable to the La Paloma Generating Company, LLC (La Paloma) project:

FEDERAL

Executive Order 12898, "Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations." This order focuses federal attention on the environment and human health conditions of minority communities and calls on agencies to achieve environmental justice as part of this mission. The order requires the US Environmental Protection Agency (EPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this problem. Agencies are required to identify and address any disproportionately high and/or adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations. The Energy Commission receives federal funds and is thus subject to this Executive Order.

STATE

CALIFORNIA GOVERNMENT CODE, SECTION 65995-65997

As amended by SB 50 (Ch. 407, Sec. 23), states that public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities.

LOCAL

KERN COUNTY GENERAL PLAN

Public facilities component pertinent to socioeconomics.

POLICY No. 8

In evaluating a development application, Kern County will consider impacts on the local school districts.

IMPLEMENTATION E

Requires the determination of the local cost of facility and infrastructure improvements and expansions that are necessitated by new development of any type and requires the preparation of a schedule of charges to be levied on the developer at the time of approval of the Final Map.

SETTING

The La Paloma project is located in the rural oil fields of western Kern County. For a full description of the socioeconomic setting, please refer to the project description and location (3.0) in the La Paloma AFC, Vol. I., July 1998 (La Paloma 1998). The study area (affected area), defined by La Paloma in the socioeconomics section of the AFC, includes: western Kern County, Bakersfield, Buttonwillow, Maricopa, McFarland, McKittrick, Taft, Shafter, Wasco, and the unincorporated areas of Fellows, Ford City, and Derby Acres. These communities are within the one-way commute distance of the power plant site in which construction and operations workers may live.

IMPACTS

Staff reviewed the La Paloma AFC, Vol. I, July 1998, socioeconomic section (La Paloma 1998) regarding potential impacts to community services and infrastructure (i.e., employment, housing, schools, utilities, emergency and other services), and environmental justice. Based on its independent review, and the fact that data provided in the socioeconomic section of the AFC was provided by and is referenced to governmental agencies and trade associations, staff finds the AFC's socioeconomic analysis and conclusions to be acceptable.

EMPLOYMENT

The analytical tools (gravity and input-output models) used in the AFC by La Paloma to estimate impacts from the La Paloma project on the affected area are widely used and are acceptable to staff. Gravity models relate to incoming population (non-local population) and answer the question of where people will likely live. The gravity model assumes that the attractiveness of a community (whether for shopping or as a place to live) increases with the size of the community (at least for smaller communities) and decreases with the distance that must be traveled to get to the community (Siegler 1979). The results of the gravity model, as presented by La Paloma in the AFC, are that 66 percent of the non-local construction workers (approximately 69 workers at peak construction) are expected to live in Bakersfield. This is a result that staff would expect because more amenities are available in Bakersfield when compared to the communities closer to the project site. The model further indicates that approximately 22 percent or 23 workers will likely live in Taft or Maricopa, 11 percent or about 12 workers will likely live in Shafter or Wasco; and about one worker will live in Buttonwillow.

The Impact Analysis For Planning (IMPLAN) model is a common regional economic tool used by The University of California at Berkeley. La Paloma has used this tool to assess other generating projects in the area and it is a common regional economic tool.

In general, most multipliers are estimated by showing the total change divided by the initial change. Employment multipliers refer to the total additional employment stimulated by the new activity. IMPLAN, a type of input-output model is a disaggregated type of model which divides the (regional) economy into sectors and provides a multiplier for each sector (Lewis et al. 1979). It was appropriate for La Paloma to use a gravity model to distribute the incoming non-local population, and then an input-output model (IMPLAN) to estimate the overall employment resulting from the project. The employment multipliers used by La Paloma (3.23 for construction and 2.88 for operations) are within an acceptable range of 2 often cited by many economists. The 2.88 multiplier for operations is based on a large electrical facility, the Midway Sunset power plant, in Kern County (Smith 1999).

The peak of construction, when the highest number of workers will be needed, is expected to occur in the 15th through 20th months of construction. The greatest number of construction workers, estimated to be 747 workers, will be needed in the 18th month of construction. Approximately 642 of these workers are expected to come from the communities in the affected area (within a two-hour commute radius), and approximately 105 are expected to relocate from communities outside of the two-hour commute radius.

The number of construction workers needed outside of the peak construction period will range from fewer than 100 in the first four months of construction to approximately 519 workers in the 21st month of construction. The average number of non-local workers needed for power plant construction will be 55; 66 for power plant and transmission line construction. During operation of the project, about 35 workers will be needed to maintain and operate the project. Approximately 15 of these operations workers may be non-local.

HOUSING

As of January 1997, approximately 79,572 housing units existed in Bakersfield, 3,311 in Shafter, 4402 in Wasco, 2,418 in Taft, 1,583 in McFarland, and 453 in Maricopa. There are approximately 91,739 total housing units within a two-hour commute, represented by these communities. The vacancy rate for this housing averages approximately five percent. Therefore, approximately 4,587 single-family, multi-family and mobil homes are generally available. In addition, there are approximately 5,760 total motel/hotel rooms in those same communities, with the availability being about 30 percent on average or 1728 rooms. The combination of housing and motel/hotel rooms likely available to non-local construction and operations workers for this project is more than sufficient for worker needs.

SCHOOLS

Based on 55 average non-local construction workers, 50 school-aged children, not 42¹ as it appears in the La Paloma AFC, and 14 school-aged children for plant operation will be added to the affected area schools. Based on the results of La Paloma's use of a gravity model, most project-related school children are expected to enter Bakersfield schools at the K-8 grade level. According to Table 5.10-6 in the AFC, schools in the

¹ Miscalculation in AFC at 5.10.2.5

Bakersfield City School District and Kern High School District are generally at- or over-capacity. Schools in western Kern County, closer to the project site, appear to be well below capacity in most cases. The addition of project-related children to schools that are at- or over-capacity may increase costs in terms of supplies, equipment and/or teachers. However, according to Senate Bill 50, signed by Governor Wilson on August 27, 1998, which amended section 17620 of the Education code, school funding is restricted to property taxes and statutory facility fees collected at the time the building permit is acquired (\$0.31 per square foot of covered or enclosed space). Public agencies may not impose fees, charges or other financial requirements to offset the cost for "school facilities." School facilities are defined as "any school-related consideration relating to a school district's ability to accommodate enrollment."

The life of the La Paloma power plant is estimated by La Paloma in the AFC to be 35 years. Property taxes on the plant have been estimated to be \$50,988,000 in the first 10 years with approximately 61 percent (Barnett 1998) earmarked for education (at 1.2 percent of the estimated \$500 million capital cost) according to the La Paloma AFC. The net present value of the estimated property taxes cited above at 5.29 percent, the 30-year long-term treasury yield (as of 6/99) is \$30,450,660. The total employment, estimated by La Paloma, using an IMPLAN model, is the equivalent of 1,457 jobs (includes 1,006 secondary jobs), based on an average of 451 project-related construction jobs and a multiplier of 3.23. For project operations, an average of 35 jobs with an IMPLAN multiplier of 2.88 results in an equivalent of 101 total jobs (includes 66 secondary jobs).

It should be noted that in the La Paloma AFC, the Kern County Superintendent of Schools is quoted as saying, "the project will not have a significant environmental effect in the area of school facilities" (La Paloma 1998). The person who provided that quote, Mr. Steven Hartsell, is the Director of School District Facility Services, under the Superintendent of Schools. Per Mr. Hartsell, recent legislation precludes local and state agencies from imposing fees or other required payments on development projects for the purpose of mitigating possible enrollment impacts to schools (Hartsell 1999).

UTILITIES, EMERGENCY AND OTHER SERVICES

The West Kern Water District can meet the project's water supply needs within their existing capacity, PG&E will provide electricity during project construction, and Kern River Gas Transmission Company is the natural gas provider. The project is not expected to place significant demands on the Kern County Fire Department or the Westside District Hospital, during construction or operation.

FINANCIAL

La Paloma estimates (La Paloma 1998, p. 5.10-19) that the construction payroll will be \$146 million (1998 dollars) for 22-24 months, and the operation payroll will be \$6 million (1998) dollars for 35 years, the bulk of which will be spent in the affected area communities. La Paloma estimates that \$42 to \$43 million worth of materials and equipment will be purchased locally during construction and that about \$6.1 to \$7.0 million will be spent locally for operating supplies annually for over 35 years. This spending will generate sales tax revenues for the local jurisdiction (about one percent for the county, and about 6.25 percent for the State, for a total of 7.25 percent).

ENVIRONMENTAL JUSTICE

The EJ screening analysis contained in the AFC (p. 5.10-4) is consistent with the federal EJ guidelines, and the analysis is acceptable to staff. According to the federal EJ guidelines, a minority or low income population exists if the minority or low income population percentage of the affected area is fifty percent of the affected area's general population or greater.

The EJ analysis in the AFC indicates that the affected area's minority population is less than 50 percent. According to the data presented in Table 5.10-2 in the AFC, 31 percent of the affected area population are non-white, based on 1990 US Census Data. More recent minority population data for the total affected area was not available. However, using estimated 1998 minority and total population data for Bakersfield (La Paloma 1998, p. 5.10-2), the growth area of Kern County, staff concludes that the affected area would still fall below the 50 percent threshold, at an estimated 34 percent, to find EJ an issue. In addition, the highest low-income population percentages are for McFarland and Wasco at 27 percent. Therefore, further EJ analysis is not necessary.

CUMULATIVE IMPACTS

Cumulative impacts might occur when more than one project has an overlapping construction schedule that creates a demand for workers that cannot be met by local labor, resulting in an influx of non-local workers and their dependents. At the time of filing of the La Paloma AFC, no other power plant projects were identified in the vicinity of the LPGP. The La Paloma AFC included a discussion of cumulative impacts and concluded that there were none.

Since the La Paloma filing, several other power plant projects in western Kern County have either filed AFCs, or are expected to soon. Sunrise Cogeneration and Power Project filed an AFC on December 21, 1998, for a 300MW cogeneration project which will be located near the community of Fellows. Elk Hills Power, LLC filed an AFC on February 24, 1999, for a 500MW combined cycle power plant to be located at Elk Hills. AFCs are expected to be filed for the Midway-Sunset and Pastoria projects in May and November 1999, respectively.

SOCIOECONOMICS TABLE 1 shows the estimated number of workers by month for the projected and estimated construction schedules for each of the power plant projects identified above. There are approximately six months that the five projects will have overlapping construction schedules. During this period, the total number of workers needed for all five projects ranges from approximately 1,382 to 1,884². As of February 1999, the number of unemployed workers in the Kern County labor force was 38,800 out of a total civilian labor force of 277,800 (State of California – Employment Development Department, preliminary data, 1999). These numbers are for all workers, not just construction workers.

² The number of workers for the Sunrise project's related facilities, such as the gas supply line and electric transmission line, were not available for this analysis.

Staff agrees that the LPGP will primarily draw on the local labor force for construction and operation. No significant influx of permanent employee or secondary employment households is expected due to the LPGP because Kern County has a large available labor pool. With the addition of each subsequent project into the construction phase, the ability of the available local labor force to meet project construction needs decreases. The cumulative need for workers in particular crafts or specialties will exceed the availability of workers in those crafts in the local area at different times based on the numbers of specialists available and the total number of specialists needed. Each of the currently filed projects has identified their expectations for local vs. non-local workers based on the available work force by craft and their expectation of worker availability based on other project needs.

La Paloma, likely the first of the five projects to start construction, estimates that 86 and 14 percent of their average worker needs will be supplied by local and non-local workers, respectively. For peak construction, the percentages remain relatively unchanged. Sunrise's estimates are basically the same as La Paloma's. The Elk Hills AFC estimates 80 percent local and 20 percent non-local construction workers for average and peak periods. These expectations for local verses non-local workers are consistent with the availability of general construction laborers and the availability of workers in specific crafts in Kern County. There is sufficient housing available in Bakersfield and other communities closer to the project sites to meet all non-local worker needs.

SOCIOECONOMICS Table 1
Cumulative Construction Workers (Estimated)

	La Paloma	Sunrise*	Elk Hills	Midway-Sunset**	Pastoria**	Total
Year 2000						
Jan						
Feb						
Mar	53	64				117
Apr	76	75				151
May	148	96				244
Jun	222	142				364
Jul	304	157				461
Aug	403	197	111			711
Sep	467	233	128	111		939
Oct	555	241	142	128		1066
Nov	597	255	195	142		1189
Dec	637	237	241	195	72	1382
Year 2001						
Jan	665	213	306	241	140	1565
Feb	714	193	333	306	210	1756
Mar	729	124	352	333	289	1827
Apr	699	104	347	352	382	1884
May	625	78	329	347	444	1823
Jun	521		317	329	527	1694
Jul	399		310	317	567	1593
Aug	195		231	310	605	1341
Sep	141		158	231	631	1161
Oct			124	158	678	960
Nov				124	692	816
Dec					664	664
Year 2002						
Jan					593	593
Feb					495	495
Mar					379	379
Apr					185	185
May					134	134
Jun						

* Does not include electric transmission line, gas line and water line workers.

** AFCs not yet filed. The number of workers are estimated, based on generating capacity of the project, compared to the three projects that have filed AFCs.

Based on an average of approximately 1,706 workers during the six months of overlapping construction for all five projects, and using a multiplier of 3.23, approximately 3,804 secondary jobs are expected to result during that period. Staff does not expect a significant number of these jobs to be filled by non-local workers because these jobs are expected to be temporary, coincident with the construction schedule, and salaries associated with indirect and induced jobs generally do not attract new workers to an area. Over a period of approximately 21 months, secondary jobs, related to the construction of two or more of these projects at the same time, are expected to range from approximately 261 to 4,201.

Using a 2.88 multiplier, secondary jobs expected from the operation of the projects range from 111 for two projects to 246 for all five projects (based on estimates of 59 employees for the La Paloma and Sunrise projects, and 131 employees for all five projects). These secondary jobs are expected to be filled from the local work force.

Based on an estimated average of 258 non-local workers for all five projects during construction, and assuming the average family size to be 2.91 persons (State of California, Department of Finance 1998), approximately 235 children are expected to be added to Kern County Schools. These children will not enter and leave the schools at the same time, but will enter and leave schools over a period ranging from four to 19 months. During operation of the five projects, approximately 48 children are expected to be added to western Kern County schools as a result of non-local workers relocating their families. The increase in school enrollments due to the five projects during construction will likely cause an impact on those schools in the Bakersfield area that are currently at- or over-capacity. The increase in school enrollments due to the five projects during operation is not expected to cause an impact because these students will likely attend schools in the vicinity of the projects, and these schools are typically under-capacity.

The Kern County Fire Department (fire department) will provide emergency medical response for the proposed power plants. The fire department believes that they have adequate resources to provide emergency medical response for the five power plants that have been identified in this cumulative analysis.

The fire department's fire fighting resources are generally sufficient to cover all five of the proposed power plant projects. The fire department has identified a need for one new ladder truck to maintain its current level of service and to effectively respond to the types of emergency incidents that occur at facilities such as the proposed power plants. Specifically, the fire department sees an increase in the number of emergency responses that will require High Angle and Confined Space Specialist Technicians and equipment. The fire department requires one new, properly equipped, ladder truck that will be assigned to Station 21 at Taft, nine new personnel to cover three work shifts per day, and a new replacement ladder truck approximately 15 years in the future.

Currently, the County has three ladder trucks, two in service and one as a backup. All three trucks are located in the metropolitan Bakersfield area. The closest ladder truck is about 40 miles away from the four power plants proposed for western Kern County. This distance makes dispatching to the area where the power plants are planned unacceptable due to the excessive response time.

The fire department estimates the cost of a new, properly equipped, ladder truck to be \$700,000, the cost of the first year's funding for the nine new personnel to cover three shifts per day for the ladder truck to be \$750,000, and the cost for the first year of a ladder truck replacement fund to be \$75,000. These costs should be paid by the four power plant projects currently proposed for western Kern County (La Paloma, Sunrise, Elk Hills and Midway-Sunset West) that will benefit directly from the new ladder truck. Because full property tax payments for these new power plants will not begin until approximately 18 months after start of construction, the fire department will require up-

front payments from each of the power plant owners to cover the costs for the new ladder truck, staff for the truck, and the replacement truck fund.

The fire department estimates that the new ladder truck will take nine months to be delivered once ordered. The need for the new ladder truck begins with the start of construction of the second power plant in western Kern County. Current estimates are that construction of the second power plant will begin approximately March 2000.

Staff is aware that La Paloma, LLC is in negotiations with the fire department to reach an agreement on funding for the three items the fire department has identified as resource needs. This agreement is expected to involve up-front payments by La Paloma for the new truck, staffing and replacement truck fund. La Paloma will then be reimbursed by the County and/or the other power plant owners as appropriate.

According to the Kern County Fire Department (Chaffin 1999), the Fire Department estimates that the Fire Fund share of the property taxes paid by the four projects expected in the Taft area will be approximately \$1,371,500 per year. This amount is based on the estimated property tax payments described in the AFCs for the La Paloma, Sunrise and Elk Hills projects. Taxes for the Midway-Sunset project were estimated based on the Elk Hills project (both are 500 megawatt projects).

The State Board of Equalization, at an April 21, 1999 Property Tax Committee meeting, formally adopted to assess only power generating facilities with a Certificate of Public Convenience and Necessity (CPCN) using unitary valuation and allocation of revenues on a countywide basis. This action provides that local collection and distribution of property taxes will apply to the La Paloma project and other power plant projects proposed for Kern County.

The Kern County Sheriff will provide police service for the five new projects, and existing resources are expected to be adequate to meet law enforcement needs during construction and operation of the five projects. Westside District Hospital serves the area for the five new projects, and their facility is expected to adequately meet medical service needs during construction and operation of the five new projects.

FACILITY CLOSURE

PLANNED CLOSURE

La Paloma's AFC provides for the inclusion of socioeconomic LORS which will be incorporated into the facility closure plan when it becomes necessary at the end of the project's economic life. The socioeconomic impacts of facility closure will be evaluated at that time.

UNEXPECTED TEMPORARY CLOSURE

Any unexpected, temporary closure would not likely cause any significant environmental impacts on the affected area, because the likely result of a temporary closure would be reactivation of the power plant by the same or a new owner within a relative short period of time. Personnel changes may occur if there is an ownership change, but

socioeconomic impacts would not change significantly because the number of operating personnel would remain relatively the same.

UNEXPECTED PERMANENT CLOSURE

Any unexpected, permanent closure of the La Paloma project would not likely cause any significant environmental impacts on the affected area, because facility closure impacts would be similar to construction impacts, and staff has found no socioeconomic, significant impacts due to the construction of the project.

MITIGATION

La Paloma contends that impacts to schools will be mitigated by the property taxes paid in connection with operation of the proposed project. Staff has determined that, even though a significant cumulative impact has been identified for Kern County schools during the construction period for four power plant projects in western Kern County, including La Paloma, with the changes to the Education Code resulting from the passage of SB 50 in 1998, school funding is now restricted to a combination of property tax revenues and a statutory development fee based on a project's covered or enclosed space.

A potential cumulative significant impact on the Kern County Fire Department has been identified. This impact results from the construction and operation of the La Paloma and one-to-three other power plant projects in western Kern County (Sunrise, Elk Hills and Midway-Sunset West). The introduction of the new power plants in this area reduces the fire department's emergency rescue capabilities below acceptable levels. The owners of the La Paloma project should be required to pay the Kern County Fire Department a share of the cost to bring the fire department's emergency rescue capabilities up to acceptable levels. The Sunrise, Elk Hills and Midway-Sunset West projects will also be required to pay a share of the fire department costs. Should one or more of the Sunrise, Elk Hills or Midway-Sunset West projects not be certified as expected, La Paloma's share of the cost for the new ladder truck, truck staffing and replacement truck will change.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The estimated gross benefits from the project include increases in the affected area's property and sales taxes, employment, and sales of services, manufactured goods and equipment.

Staff agrees with La Paloma's conclusions in the AFC that the project will not cause a significant adverse impact on the affected area's housing, schools, police, fire, emergency services, hospitals, utilities and employment if mitigation for schools and the fire department are provided consistent with the proposed conditions of certification.

The project, as proposed, is consistent with all applicable socioeconomic LORS. The proposed conditions of certification ensure compliance with LORS, and mitigation of the identified cumulative impact on the Kern County Fire Department.

RECOMMENDATIONS

For the area of socioeconomics, staff recommends that, with the adoption of the following conditions of certification, the La Paloma project be approved.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner shall pay the statutory school impact development fee as required at the time of filing for the “in-lieu” building permit with the Kern County Department of Engineering and Survey Services and Building Inspection.

Verification: The project owner shall provide proof of payment of the statutory development fee in the next Monthly Compliance Report following the payment.

SOCIO-2 Not later than 30 days after certification, the project owner shall reach agreement with the Kern County Fire Department on funding for the following:

- a) purchase of a new 105-foot Pierce Quint Aerial ladder truck equipped for high angle and confined space rescues;
- b) first year funding for nine new positions for personnel to cover three shifts per day for the new truck; and
- c) first year funding for a replacement ladder truck.

Verification: Not later than 45 days after certification, the project owner shall provide the CPM with a copy of an agreement with the Kern County Fire Department for funding of items a) through c) above.

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SOIL AND WATER RESOURCES

Supplemental Testimony of Joseph O'Hagan

INTRODUCTION

La Paloma Generating Project's (LPGP [1999]) is requesting to use either a zero liquid discharge system or injection wells for wastewater disposal. In the Final Staff Assessment (FSA), staff evaluated the applicant's proposed use of injection wells to dispose of wastewater from the proposed project. Since that time, a draft Underground Injection Control (UIC) Permit for the proposed injection wells has been released by the United States Environmental Protection Agency (EPA [1999]). In addition, LPGP (1999b) has submitted supplemental information on the zero discharge system. Therefore, this supplemental testimony provides an update on EPA permitting of the injections wells, discusses LPGP proposed use of a zero discharge system as an alternative to use of the wells and proposes conditions of certification.

Wastewater from the proposed project to be disposed of by either injection wells or the zero discharge system will consist mainly of cooling tower blowdown and water from the oil-water separator and is non-hazardous. Soil and Water Resources Table 1 below provides the estimated wastewater flows under both average and peak operating conditions. Sanitary waste will be disposed of to the sanitary leach field and stormwater runoff will be discharged to on-site retention basins.

SOIL & WATER RESOURCES Table 1
Estimated Wastewater Volumes

Waste Stream	Daily Average	Daily Maximum
Cooling Tower Blowdown	501,000 gpd	698,000 gpd
Oil-Water Separator	43,000 gpd	43,000 gpd
Total to Injection Well	544,000 gpd	732,000 gpd

Source: LPGP 1998a

INJECTION WELLS

LPGP (1999a) submitted a Class 1 Injection Well Permit Application to the EPA for three injection wells, including well La Paloma No. 1, which was drilled as a test well to a depth of 1,600 feet. Since that time, it was decided that La Paloma No. 1 will not be used, instead LPGP (1999b) will rely on two new wells, one well will primarily be used while the second well will serve as a backup. The application requested permission to inject wastewater into the Tulare formation at a depth between 385 and 1,000 feet beneath the ground surface.

On June 7, 1999, EPA issued a draft Underground Injection Control Class I Permit for two injection wells for the proposed project. This draft permit indicates EPA's preliminary determination to approve the permit. A 30-day public review period follows issuance of the draft permit. After the close of the public review period, depending on

the comments received, EPA will issue a final decision. Once the final permit is issued, it is good for up to ten years.

The draft permit (EPA 1999) contains specific and general conditions. The specific conditions address well construction specifications, injection intervals, mechanical integrity requirements, and injection pressure and rate limitations. No hazardous wastes or wastes from other facilities may be disposed of in these wells. Continuous monitoring of injection fluid rate, volume and temperature, injection and annular pressure are also required. General conditions are those applied to all injection well permits and address the same issues regarding construction and operation of the injection wells.

ZERO DISCHARGE SYSTEM

Zero discharge technology, refers to wastewater disposal options that don't involve the release of wastewater to land or surface or groundwater. LPGP (1999b) provided supplemental information that described the proposed zero discharge system and discussed potential impacts from operation of the system. Wastewater treatment in the proposed zero discharge system will consist of filtration, a vapor compression process and crystallization or similar process. The treatment process and associated flows under average operating conditions are shown in Soil & Water Resources: Figure 1.

The wastewater stream will be filtered to remove solids. The first process, the evaporator/condenser is used to reduce the volume of the wastewater. In general, this type of wastewater treatment process involves passing the wastewater flow through a heat exchanger where the water is heated to near boiling temperatures. The wastewater then is passed over an evaporator (EPRI 1996). The vapor compression process typically yields a high quality reusable water stream equaling 85 to 99 percent of the original wastewater flow (ERI 1996). LPGP (1999b) estimates that the return will be as high as 95 to 99 percent. The remaining one to five percent of concentrated brine will be treated by a Calandria or similar type of crystallizer. In a Calandria system, the brine concentrate is circulated through a heat exchanger, which evaporates off the most of the remaining water leaving a solid waste to be disposed of at a landfill. LPGP (1999) estimates, based upon average operating conditions approximately 7.25 tons per day of solids will be generated. During peak operation, approximately 9.0 tons of solids per day may be generated. A filter press may be added to further remove water if necessary. As shown in Soil & Water Figure 1, distillate water from the evaporator/condenser and the crystallizer will be recycled to the cooling towers or the demineralizer water treatment system. LPGP (1999) estimates that, because of this water recycling associated with use of the zero discharge system, water demand for the proposed project may be reduced as much as ten percent, a reduction of approximately 573 acre feet per year under average operating conditions.

Hazardous waste in California is characterized by a number of criteria, including toxicity (Code of California Regulations, Title 23, Section 66261.24). Toxicity is determined if representative samples of the waste exceed in part numerical standards. If these standards are exceeded then the waste is deemed hazardous. For wastewater from the proposed project, heavy metals are the constituents of concern. Based upon the

anticipated wastewater quality of the project, LPGP (1999b) estimated heavy metal concentrations in the resulting cake solids from the zero discharge system. These were then compared with the toxicity criteria for hazardous materials for these metals. The estimated concentrations in the cake solids were well below the threshold for hazardous waste classification.

CONCLUSIONS AND RECOMMENDATIONS

Staff finds that the use of either injection wells or a zero discharge system is an acceptable wastewater disposal method and should not cause any adverse environmental impacts to soil and water resources. Furthermore, construction and operation of these alternative wastewater disposal methods should comply with all applicable laws. Staff proposes the following revised condition of certification.

CONDITIONS OF CERTIFICATION

SOIL&WATER-4: The project owner shall notify the California Energy Commission Compliance Project Manager within 60 days of certification of the project the wastewater disposal methodology, either injection wells or a zero liquid wastewater discharge system, that will be used by the facility. If injection wells are the selected wastewater disposal option, the project owner shall provide a copy of the approved final Underground Injection Control Permit from the EPA for the proposed injection wells to staff and notify the Energy Commission CPM of any changes to the permit. If the zero liquid wastewater discharge system is the selected methodology, the project owner shall submit to staff a description and schematic of the system. Within 60 days of beginning operation of the project, the project owner shall submit to staff the results of Waste Extraction Test of the residual cake solid waste from the zero discharge system.

Verification: Within sixty (60) days of certification, the project owner shall submit in writing a description of the selected wastewater disposal methodology to the Energy Commission CPM. If injection wells are selected, this notification shall include a copy of the approved final Underground Injection Control Permit from the EPA. The project owner shall notify the Energy Commission CPM in writing of any proposed changes to this permit, either initiated by the project owner or by the EPA. The project owner shall provide a status report on injection well construction and operation to the Energy Commission CPM in the annual compliance report. If a zero liquid discharge system is the selected disposal methodology, a status report on construction and operation of the system, including the volume of residual cake solids generated and the landfills used for disposal in the annual compliance report.

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